

JUL 15 1922

Old
Series,
Vol. XLVII

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. XXXIX

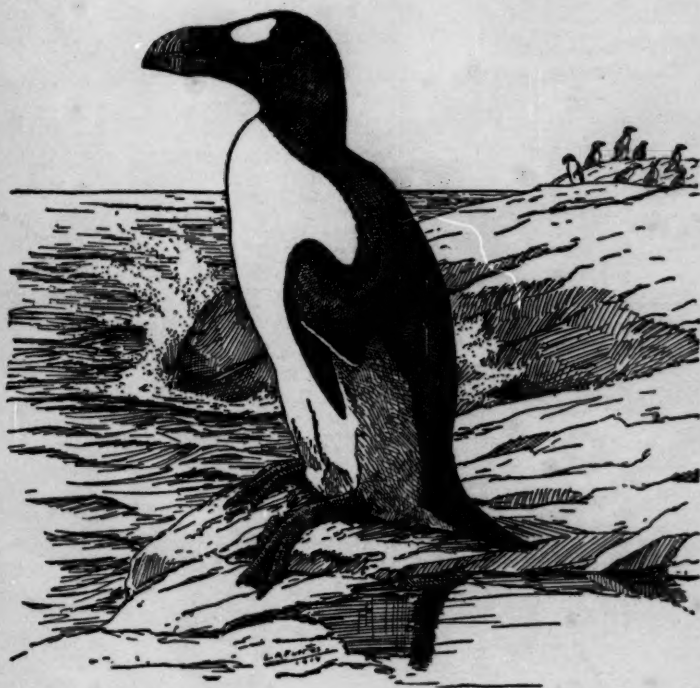
The Auk

A Quarterly Journal of Ornithology

Vol. XXXIX

JULY, 1922

No. 3



PUBLISHED BY

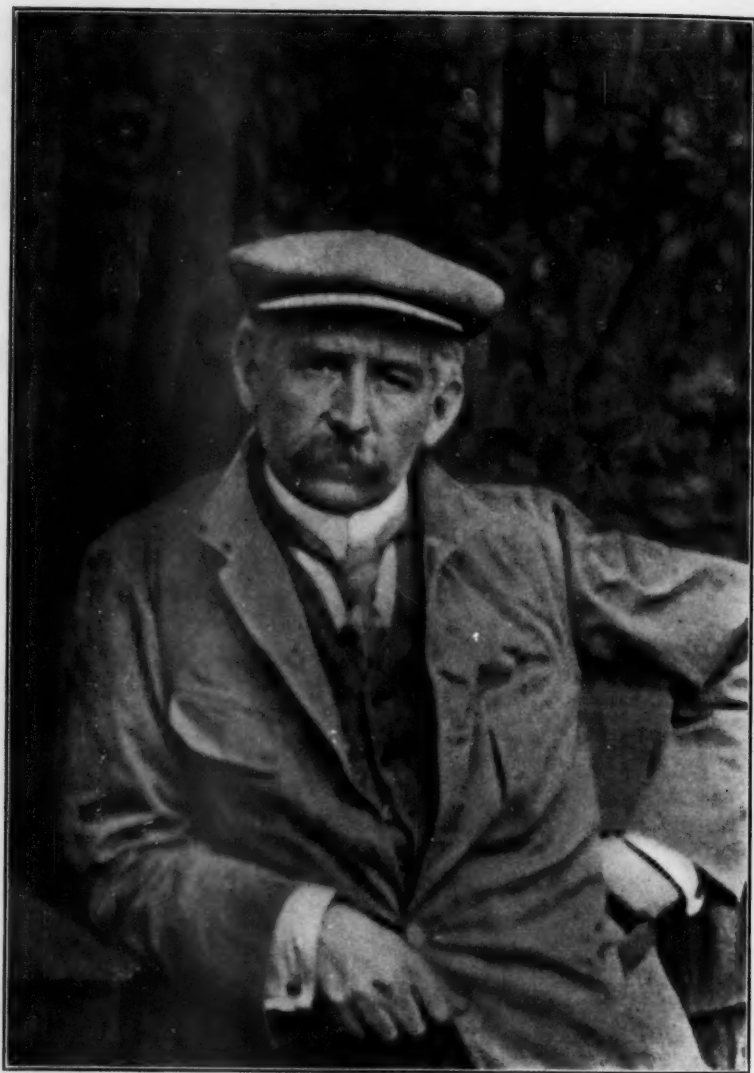
The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

CONTENTS

IN MEMORIAM: WILLIAM PALMER. By Charles W. Richmond (Plate X).....	305
TRAPPING DUCKS FOR BANDING PURPOSES. By Frederick C. Lincoln (Plates XI to XIV)	322
BIRD BANDING AT THOMASVILLE, GEORGIA, IN 1922. By L. R. Talbot (Plates XV to XVII)	334
BIRD NOTES FROM NORTH GREENLAND. By Langdon Gibson.....	350
ON SOME NEW AND RARE BIRDS FROM COREA. By Naganichi Kuroda and Tamezo Mori.....	364
RECENT NOTES FROM AN OLD COLLECTING GROUND IN NORTH-EASTERN ILLINOIS. By Colin Campbell Sanborn.....	367
THE ROLE OF THE "ACCIDENTAL." By Joseph Grinnell.....	373
NOTES ON FOOD HABITS OF THE SHOVELLER OR SPOONBILL DUCK (SPATULA CRYPEATA). By W. L. McAtee.....	380
THE SONG OF THE FIELD SPARROW. By Aretas A. Saunders	386
THE BREEDING HABITS OF THE NORTHERN RAVEN IN PENNSYLVANIA. By Richard C. Harlow.....	399
GENERAL NOTES.—The Iceland Gull (<i>Larus leucopterus</i>) in California, 411; Pelicans in the Interior of Alabama, 411; Elder Duck—A Correction, 411; <i>Anas diazi northamericana</i> and <i>Grus americana</i> in Nebraska, 412; Whooping Cranes (<i>Grus americana</i>) in Texas, 412; <i>Florida caerules</i> in Saratoga County, N. Y., 413; Greater Yellow-legs Records at Elizabeth, N. J., 413; A Remarkable Specimen of the Piping Plover (<i>Charadrius melodus</i>), 414; Summer Shore Birds, 414; Passenger Pigeons Not in Company Front, 416; An Unusual Flight of Black Vultures in Nelson County, Kentucky, 416; The Food of Long-eared Owls, 417; The Yellow-billed Cuckoo in Europe, 417; A Large Gathering of Kingbirds, 417; Arkansas Kingbird in Massachusetts, 417; Arkansas Kingbird in Plymouth County, Mass., 418; Wintering of the Canada Jay in Massachusetts, 418; The Lapland Longspur in Colorado, 419; Bachman's Sparrow (<i>Peucaea aestivalis bachmani</i>) in N. E. Illinois, 420; The Carolina Junco (<i>Junco hyemalis carolinensis</i>) on the Coast of South Carolina, 420; <i>Junco oreganus montanus</i> in Oregon, 421; Evening Grosbeak at Ellen ville, N. Y., 421; Evening Grosbeak at Winsted, Conn., 421; Rare Winter Birds at New Hampton, Iowa, 422; Bohemian Waxwings at Topeka, Kas., 422; <i>Wilsonia pusilla chrysola</i> in New Mexico, 423; <i>Wilsonia pusilla pusilla</i> in Colorado, 423; Nesting Sites of the Long-billed Marsh Wren, 423; Defense Note of the Chickadee (<i>Parus atricapillus atricapillus</i>), 423; Notes from Collins, N. Y., 424; Notes from Essex, Massachusetts, 1921, 425; Notes from Lauderdale, Fla., 425; Birds Using their Wings as a Means of Propulsion under Water, 426; Bird Catastrophe at Gordon, Nebraska, 428; Flight Songs and Mating Songs, 428; Aeolian and Percussion Bird Music, 429.	
RECENT LITERATURE.—Nelson's 'Lower California and Its Natural Resources,' 431; Chance's 'The Cuckoo's Secret,' 432; Beebe's 'A Monograph of the Pheasants' Vol. III, 433; Van Oort's 'Birds of the Netherlands,' 435; Swann's revised 'Synopsis of the Accipitres,' 435; Mathews' 'The Birds of Australia,' 436; Bannerman on 'The Birds of Southern Nigeria,' 437; Witherby's 'Handbook of British Birds,' 437; Kutchin's 'What Birds Have Done with Me,' 437; Recent Papers by Riley, 438; Check List of the Birds of Essex County, Mass., 438; McGregor and Marshall on Philippine Birds for Boys and Girls, 438; The Provencher Society of Natural History of Canada, 439; Todd on the Genus <i>Myiobius</i> , 439; Misses Baxter and Rintoul on some Scottish Breeding Ducks, 439; Chapman on South American Birds, 440; Wetmore and Peters on New American Birds, 440; Bangs on Philippine Birds, 440; Palmer on Game as a National Resource, 441; Hewitt's 'The Conservation of the Wild Life of Canada, 441; Hartert's 'Die Vogel der palaarktischen Fauna,' 442; Food Habits of Two Owls in Britain, 442; Bird Enemies of Two Exotic Insect Pests, 443; The Ornithological Journals, 443; Ornithological Articles in Other Journals, 449; Additional Publications Received, 450.	
NOTES AND NEWS.—Obituary: George Spencer Morris, 451; Alfred Grandidier, 453; Frank Ernest Woodward, 454; Col. Basil Hicks Dutcher, 454; Field Ornithological Staff, 455; The Baird Club, 455; John H. Sage, birthday celebration, 455; A. O. U. Members Abroad, 456; Fortieth Stated Meeting of the A. O. U., 456.	



truly yours
Wm Palmer

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXXIX.

JULY, 1922.

No. 3

IN MEMORIAM: WILLIAM PALMER.

BORN AUGUST 1, 1856—DIED APRIL 8, 1921.

BY CHARLES W. RICHMOND.

Plate X

WILLIAM PALMER, a Fellow of the American Ornithologists' Union since 1898, and a veteran field naturalist of Washington, died in Bellevue Hospital, New York City, on April 8, 1921, in his sixty-fifth year. Born at Penge, a civil district in the south of London, on August 1, 1856, the son of Joseph and Letitia (Griffen) Palmer, he spent the first twelve years of his life in that vicinity. His father, who was born at Barrow, Suffolk, England, in 1836, followed the art of taxidermy from early manhood, was a skilled modeler, and excelled in the making of plaster casts, and the coloring of reproductions, and similar work. He was engaged for several years at the Crystal Palace, in Sydenham, not far from Penge, assisting Prof. B. Waterhouse Hawkins with his celebrated restorations of extinct animals. William Palmer, as a small boy, used to visit his father's working quarters, where he came into contact with men whose wisdom impressed him strongly, and whose learning he longed to emulate. It was doubtless at this early period, and under these influences, that his thoughts were

directed into scientific channels and especially toward natural history; in any event, his interest in nature dated back to very youthful days. Little additional information concerning his early life is available to the writer, except that he went to school in season and undertook odd jobs of work in his leisure moments, after the habit of boys. Prof. Hawkins, who had received a commission to produce similar restorations for Central Park, in New York City, came to this country in 1868, accompanied by Joseph Palmer and his family, consisting of his wife, son William, and a daughter, Mary. The elder Palmer continued to assist Prof. Hawkins with his restoration work until the project was abandoned, after which he obtained a position as taxidermist at the Park, serving also as general assistant at the museum, and for a time was in charge of the zoological garden. In 1873, he came to Washington, and secured a position as taxidermist and modeler at the National Museum, a position held by him (with slight alterations in title) until the time of his death, in 1913, although in later years his work consisted almost exclusively of reproductions of ethnological groups and figures. He was especially adept in the modeling of animal and Indian lay-figure groups, and made many of those sent to the various expositions, beginning with the Centennial at Philadelphia, in 1876.

With his early youth spent in an environment of taxidermy and modeling, of museum preparatory work, and matters connected with the installation of museum exhibits, it was not unexpected that in time William Palmer would drift into this character of work, although, as it happened, this result was not reached through his own ambition and efforts. He aimed at higher fields of endeavor, and after attending school in New York City, began a course in medicine, or of study incident to it, but lacking funds to continue it and receiving no encouragement or assistance from his father, he was forced to abandon his plans. When the family removed to Washington, young Palmer secured employment with a mercantile firm on Seventh Street, where he found the work to his liking. The elder Palmer, however, was determined to have the son follow in his footsteps, and soon found a vacancy for him at the National Museum. Accordingly, in the year 1874,

young Palmer was obliged to give up his congenial position, and reluctantly entered the service of the Museum as an assistant in modeling and taxidermy. He served thus for several years, under the tutelage of his father, working at various branches of the preparator's art, such as the molding and casting of reptiles, fishes, antiquities, the preparation of papier-maché models of Moqui and Zuni towns, and similar work. In a short time he was prepared for larger and more important undertakings, and in the spring of 1883 was sent to New Haven with the object of making large paper models of the giant squid and octopus, for display at the Great International Fisheries Exhibition in London. These were later shipped to Washington and installed in the National Museum, where they still remain. In October of the same year he was sent to Barnegat City, N. J., where he made a mold of a rare bottle-nosed whale, and preserved its skeleton in perfect condition.

In the autumn of 1885 Palmer married Miss Arminia Knowles, of Washington, who proved a faithful and devoted wife. Although sharing in no way her husband's interests in natural history, Mrs. Palmer always yielded to his plans when proposed expeditions threatened to upset their home life for extended periods.

In the summer of 1887, Messrs. Lucas and Palmer were detailed by the Museum to accompany the U. S. Fisheries schooner "Grampus" on a notable visit to Funk Island, with the particular object of securing remains of the Great Auk. Their success in this quest is well known. In addition to stopping at Funk Island, the vessel touched at several points on the coasts of Newfoundland, Labrador, and New Brunswick, where many specimens of various kinds were collected. Of the birds obtained on this cruise, Dr. Lucas reported on the remains of the Great Auk, and Mr. Palmer gave an account of the living species.

In April, 1890, Palmer was "instructed to proceed to the Pribylov Islands, Alaska, to hunt walrus for the Museum," and by the middle of May was at Unalaska, on his way to the Islands. He had the good fortune to meet with these rare animals, and to observe them at close range, but under conditions that did not admit of retrieving them if shot. A fine bull was, however, subse-

quently killed by officers of the Revenue Cutter, and Palmer was enabled to carefully study the fresh animal and to prepare its skin, which was later mounted under his direction at the Museum, where it still occupies a prominent place in the exhibition series of mammals. That he was not idle on this trip is attested by a collection of over a thousand specimens, representing many branches of natural history, secured during the three months he was in Alaskan waters. On the Fourth of July, he shot an Asiatic cuckoo on St. Paul Island, the first, and to date the only record for the genus and species in North America.

In an historical sketch of the progress of taxidermy at the National Museum, and of the opportunities afforded by the Museum in its earlier years for the development of artists in this class of work, the late Dr. G. Brown Goode wrote, with especial reference to exhibits prepared for the World's Columbian Exposition, "Mr. William Palmer, now chief taxidermist of the Museum, also received his first training during these years, and began a career which has resulted in the production of such remarkable work as the group of Caribou, prepared especially for Chicago, which, in the judgment of the writer, have not been surpassed anywhere, marking as they do the highest attainment in the imitation of nature, with that combination of life with perfect repose, which is the supreme test of merit in taxidermy." With reference to exhibits prepared for the same exposition, he observed, "A new feature in these groups was the introduction of natural leaves, grasses, plants, and sea weeds, prepared by a process invented and satisfactorily carried out by Mr. William Palmer. Vines with leaves and tendrils which had never been detached from the natural stalk, and other similar accessories, were used, producing effects which could not be obtained by artificial leaves fastened on artificial stems."

Palmer was sent to Chicago, to assist in installing some of the exhibits at the World's Fair, and later served in the same capacity at the expositions held in Nashville, Portland, and elsewhere. These several visits gave him an opportunity to add to his collections, and particularly to increase his botanical material.

Late in 1899, an archeological expedition was projected by Dr.

Edgar J. Banks, of Cambridge, Mass., with the object of making excavations at the supposed site of Ur, in ancient Chaldaea, situated at or near the present town of Mugheir, on the Euphrates River. The National Museum was invited to detail one of its employees to accompany the expedition for the purpose of making natural history and ethnological collections. Palmer was chosen as the Museum representative, and made preparations for a lengthy trip, even going to the extent of disposing of his household goods, and storing his collections and personal belongings. The director of the expedition went to Constantinople to secure the necessary permits and to arrange other details. Many vexatious delays were encountered, extending well into the year 1901, but the long expected firman was never granted and the project was reluctantly given up. While the Ur negotiations were still pending, Messrs. Palmer and J. H. Riley were detailed by the Museum to visit Cuba, where they spent several months, from February to August, 1900, chiefly in Pinar del Rio province, making general collections of animals and plants. Two years later, Palmer, in company with a local botanist, visited the eastern end of the same island, where further collections were made.

In the spring of 1903, Messrs. Lucas, Palmer and Scollick, of the Museum, were detailed to visit one of the stations of the Cabot Steam Whaling Company, on the coast of Newfoundland, for the purpose of obtaining a mold and skeleton of a sulphur-bottom whale. In this they were eminently successful, returning with the mold and skeleton of a seventy-eight foot specimen. From the mold a cast was made and colored, and both cast and skeleton are now suspended in one of the halls of the Museum, forming probably the largest individual biological exhibits in the institution.

Early in 1904, Palmer accompanied Dr. George P. Merrill, of the geological department of the Museum, to the State of Sinaloa, Mexico, with the object of making a mold of the great Bacubarito meteorite, a cast of which was later placed on exhibition in Washington. A year later, he was assisting in the installation of various Museum exhibits at the Lewis and Clark Exposition, at Portland, Oregon, and while in the West visited Mount Shasta, California,

Victoria, B. C., and other localities, for the purpose of adding to his zoological and botanical collections.

In the spring of 1908, Dr. F. W. True visited the Calvert Cliffs in Maryland, and obtained "a nearly complete skeleton of a fossil porpoise, discovered by Mr. William Palmer," which later became the type of *Delphinodon dividum* True. It was probably about this time that Palmer began to take an interest, which later became all absorbing, in the fossils, particularly the remains of cetaceans, of this famous locality. In the latter part of the year 1908, he was detailed to make collections here, and in later years undertook various other official collecting trips to the same region, obtaining much important material, particularly among cetaceans, from teeth, jaws, and other fragments, to nearly complete skeletons.

In January, 1909, Palmer started with Mr. Owen Bryant on an expedition to Java, and was absent from Washington for more than a year and a half, making large collections in the western end of that Island, at various localities in the residencies of Bantam, Batavia, and Preanger. Palmer was alone during part of the time, spending several weeks at high altitudes on the volcanoes of Gedé, Salak, and Pangerango, where he found many interesting birds, among them a robin that inhabited the craters and higher levels, which in its actions reminded him strongly of the common species of the United States. The Javan species, although discovered nearly a century before the time of Palmer's visit, was still rare in collections. On one occasion, while on the summit of Mount Salak, he carried his breakfast into the crater, boiled some eggs in one of the many hot springs, and sat down to enjoy his meal, surrounded by hundreds of steam jets, streams of hot water, and other evidences of volcanic activity. At another time he was encamped for a month or more along the coast, within sight of the island of Krakatoa whose volcano created great havoc in 1883. Possibly as a result of prolonged hard work in the hot lowlands, both travellers suffered greatly in health, and at one period Palmer passed several weeks in the hospital at Batavia, desperately ill with a bad type of malarial fever, the ravages of which were noticeable even after his return to Washington, in the summer of 1910.

The Javan expedition, undertaken at Mr. Bryant's expense, resulted in a collection of over 2,100 birds, with a large variety of miscellaneous specimens, and was divided between the National Museum and the Museum of Comparative Zoology, Cambridge, Mass.

By the time Palmer returned from Java, the natural history portions of the U. S. National Museum exhibits had been removed to the new building, and much of his time thereafter was devoted to various phases of the installation and arrangement of the zoological material, such as the formation of an exhibit of the local fauna, in which he freely drew upon his own collection for rarities, besides collecting much new and fresh material; the preparation of labels for the specimens of this exhibit; the production of certain new groups and the renovation of others, as in the Carolina Paroquet, where two groups were combined with new accessories, producing in effect, a new group. He rebuilt the flamingo group, repaired and remounted several hundred casts of American fishes, and from time to time was called upon for much special work in other directions. It may be mentioned in passing, that in the earlier years of his career, Palmer's services were many times requisitioned for the purpose of operating the lantern slide machine, in the handling of which he was an expert, in connection with illustrated scientific lectures at the Museum, the Cosmos Club, and elsewhere. He attended many technical meetings in this capacity, and was thereby enabled to absorb much information of value over a wide range of scientific topics.

When the last Passenger Pigeon died at the Cincinnati zoological gardens, on September 1, 1914, and was sent to the National Museum for preservation, Palmer had the distinction of making a specimen of this bird, an operation that was performed on the 4th, at the home of Dr. Shufeldt, who took advantage of the opportunity to study the fresh anatomy, and to make photographs of the bird at various stages of the work. Some account of this ceremony was given by Dr. Shufeldt in 'The Auk' for 1915.

Early in 1917, Palmer was detailed to visit certain cave deposits in the mountains of Pinar del Rio province, Cuba, for the purpose of securing Pleistocene mammalian remains. He obtained about

400 specimens of this class, and incidently collected a varied lot of other material.

In connection with the identification, purchase, and shipment of a rare whale skeleton, Palmer was sent to Jacksonville, Florida, on three occasions during the fiscal year 1919-1920. Early in April 1921, he accompanied the Museum mammalogist, Mr. G. S. Miller, Jr., to New York, to examine certain cetacean material at the American Museum of Natural History, in connection with an investigation in which they were jointly engaged. While attending a meeting of the Explorers' Club one evening, Palmer became ill, exhibiting symptoms probably apoplectic in origin, although the gravity of his plight was not recognized at the time. He was assisted to his hotel, but it was not until the following morning that his condition was found to be serious, when he was removed without delay to Bellevue Hospital. He died there, on the 8th of April. Funeral services were held in Washington, four days later, with interment at Rock Creek Church Cemetery.

Palmer's activity as a collector was by no means confined to official trips, for he was a diligent collector on his own account. In the spring of 1874 he began a collection of birds, and while this was at first confined to local specimens, he soon added to it material obtained on excursions made to various sections of Virginia. In time his collection became one of the notable private accumulations of Washington, and contained many local rarities and records some of which have not been duplicated. In addition to birds he was long interested in the local fauna and flora generally, especially of ferns, and contributed a long series of specimens to the collections of the National Museum during his forty-seven years connection with it. It is of record that he made the earliest discovery of several species of local plants, and among birds his finds were numerous. He obtained the first local record of Brewster's Warbler, and secured the only local specimen of Kirtland's Warbler and of the Ruff. Other record finds were Grinnell's Water Thrush, the Semipalmated Plover, and the Hawaiian Petrel, which, at that time, was also new to the American fauna. It seems only a few years ago that Palmer found a young night heron perched in a tree in the Smithsonian grounds, and deciding

that its plumage was somewhat unusual, he maneuvered until he captured the bird alive, and brought it to the Division of Birds for closer examination. It proved to be a Yellow-crowned Night Heron, the first for the local area, and still unique in this respect.

To secure specimens for his collection he made a trip to Cobb's Island, on the coast of Virginia, in the summer of 1881, and in later years made several trips to the neighboring Smith's Island, usually in company with other local ornithologists. He visited the Dismal Swamp on several occasions, and among the cane and cypress of this area he found the Florida Yellowthroat in some abundance, forming quite an extension of its former known range. A trip to the Kissimmee River region, in Florida, undertaken in February and March, 1895, in company with Messrs. Ridgway and Brown, was one of his more pretentious personal collecting ventures, and furnished him with both experience and specimens that were new. He published an account of some of the birds observed on this trip, in the 'Osprey,' in 1901, and also wrote a paper on the Florida Burrowing Owl, which appeared in 'The Auk' in 1896, in which he made some original and interesting observations on the habits of these birds.

Palmer did not hoard rarities in his personal collection, but generously distributed them elsewhere, for his chief interest lay in a study of the molt of birds, and he was for a long time a close student of plumage changes, his collection being well filled with juvenile plumages and with specimens in various stages of molt. At all times his collecting was done with a motive. He did not collect simply to amass material, but while his keen eye sought out rarities and records, his attention was focused primarily on examples that would furnish explanations in the phenomena of bird molt or such other subjects as engaged his attention at the time.

As far back as 1896, he wrote "If collectors would save their worn and molting specimens instead of throwing them away as 'worthless,' changes of plumage would be far better known." Although he studied this subject for many years, he wrote little, except in the case of a few species, where he thought he had accumulated sufficient data to warrant placing it on record. His

general tendency was to hold up a manuscript, or delay its preparation, until he had exhausted the subject, with the result that he left many pieces of work unfinished, through failure to find an explanation for each discovery connected with them. On the other hand, some of his published papers contain statements that seem largely tinctured with theory, but as he was a keen and patient observer it is quite possible some of these statements were based upon actual observation.

He had an analytical mind, and usually arrived at his results by an original course of reasoning that was entirely unbiased by the opinions of others. As an illustration of his procedure, the following may be cited from his study of the Maryland Yellow-throat group. He found, for example, that in birds from one section of Virginia the yellow of the throat extended down on the breast, terminating in a point, whereas, in those from another locality, the yellow was worn off evenly across the breast. In explanation of this, he wrote that birds of the first locality perched "on the long inclining leaves of wire-grass abundant in the marsh, bushes and twigs being uncommon. Alternate contact of the sides of the body with the grass wears the yellow tips of the feathers, leaving the center of the body almost untouched," while in the second instance the birds perched on "generally horizontal twigs" which produced a wearing of the feathers evenly across the breast. He was thus not satisfied simply to announce the character of differences observed, but sought to interpret the causes of them. Indeed, probably his most serious fault, if fault it be, was this effort to produce an explanation for each fact or discovery announced. It is certain that some of his papers were prepared only after long deliberation and with much care, and a reviewer of his contribution to the 'Avifauna of the Pribilof Islands' referred to it as a "model of painstaking work," which, indeed, it is. In this paper he added twenty-three species to those previously known to inhabit the Islands; discriminated the Ruddy Turnstone of eastern North America as distinct from the European bird, a change now generally adopted; separated an Alaskan form of the Barn Swallow, which Dr. Joseph Grinnell later named in his honor; went into much detail concerning the structure of

downy feathers and in the succession of plumages in cormorants, and introduced a new term, "mesoptile" for a type of feather between the down and the adult feather. He advanced ingenious theories as to the origin, distribution, and migration of Pribilof and other Arctic birds, and supplied much original matter on the habits and status of the various species treated, producing a most creditable work. His investigations on shrikes, embodied in a paper "Our Small Eastern Shrikes," in which the now well known Migrant Shrike was first recognized, was another subject to which Palmer devoted much time before reaching the stage of publication. His facilities for research work, limited as they were by the nature of his official duties, did not readily permit his taking up subjects beyond those that came within his own field experiences.

In addition to his contributions to ornithology, Palmer wrote a number of papers on botanical subjects, more particularly on ferns, a group in which he had been an interested student for many years. His fern collection was begun in the winter of 1873-'74, with the definite object of obtaining a good series of normal examples as well as variations, but the discovery of a new species was apparently of little interest to him. Birds and ferns were the only groups in which he had accumulated material for his private collections, except fossils, in recent years, and by the terms of his will, made in the year 1900, these two collections are bequeathed to the U. S. National Museum, with the proviso that 500 skins of birds are to go to the University of Virginia.

Although Palmer found time to contribute about sixty papers and lesser items to the scientific journals, it was as a field naturalist that he reached his greatest development, for his experience in the local region extended over nearly fifty years, and with an excellent memory for past events, he was able to recall natural history conditions as they existed here long ago. He did not give up field work with advancing years, but continued his trips with undiminished interest. He was a congenial and wholesome companion on trips afield, and frequently accompanied the younger naturalists on their excursions to neighboring parts of Virginia and Maryland. His adventures on these collecting trips were many and varied, especially while searching for fossils at low tide along the

base of crumbling cliffs, and it is not surprising that some one incident or experience should stand out with greater prominence than others. Palmer met with such an experience in 1917, when on one of his excursions to Plum Point, near Chesapeake Beach. On his way to the cliffs, he stopped as usual at the home of the Dixon family, friends with whom he put up when his work required an extended stay, and on leaving for the fossil site was followed by "Doll," the pet dog of the house, who frequently accompanied him on these trips. During the course of his work he accidentally dislodged a large mass of earth, which fell on him with crushing force pinning him on his back to the ground. Although severely injured, he succeeded in freeing his arms, and gave his attention to considering means for relief. Travel is infrequent at this point, and the imprisoned man decided that in his four-footed friend lay his only hope of an early rescue. Managing to find pencil and paper in his pockets, he scribbled a brief message explaining his predicament, and calling the dog fastened the message securely to her neck with his neck-tie, and attempted to drive her home. But "Doll" was inclined to regard this as a new play, not understanding what was expected of her. Finally, after clods of earth had been thrown at her, the animal left. Fortunately, she went directly home, but had some difficulty in gaining admittance, in spite of her barking, as Mr. Palmer was supposed to be near at hand. However, she finally succeeded, and Mrs. Dixon quickly discovered the unusual decoration. A closer inspection disclosed the message, other members of the household were notified, and a relief party was shortly on the way to the cliffs, a half mile or more distant, where the injured man was found and soon extricated from his unusual plight. He was unable to stand, and was carried back to the house, and later removed to his home. It was several weeks before he was able to return to his duties at the Museum, and for a long time thereafter he walked with a limp; in fact, is said never to have fully recovered from the effects of this experience.

Mr. Palmer was a member of several societies. Years ago he belonged to the Society of American Taxidermists, which, at its third annual exhibition, held in New York City, in May, 1883,

awarded him a special medal for a cast of a leather-backed turtle's head and a certificate of merit for mounted birds. In 1888 he was elected a member of the American Ornithologists' Union, and became a Fellow ten years later. He was a member of the American Association for the Advancement of Science, of the American Fern Society, its president ("by a nearly unanimous vote") in 1917-1918; an original member of the Washington Biologists' Field Club, and its president in 1913-1914. He was a member of the Biological Society of Washington, and a member of its council in recent years. At its meetings he read various papers, and exhibited specimens, principally of the local fauna and flora, but in later years notes on fossils largely crowded out other subjects. Two younger associations, the American Society of Mammalogists, and the American Society of Ichthyologists and Herpetologists, also claimed him as a member.

Thirty years ago an organization called the Potomac Valley Ornithological Club was launched in Washington, and numbered among its members most of the active local field ornithologists and bird lovers of that time. It held 62 bi-weekly meetings (except in the summer months), from February 1892 to April 1896. William Palmer was elected its president at the outset, and was annually reelected to the same office, almost without opposition, until the Club ceased to exist. He was a faithful attendant at meetings, and read a number of papers, among them one on the presence of wing-claws in birds; another on the "Malar stripe of the young Flicker," the substance of which was later published in 'The Osprey,' in 1901. At the meeting of December 10, 1894, he read a paper on "The Immature Bird's Skull," illustrated with specimens and drawings, in which he demonstrated a method of determining the age of birds by reference to the top of the skull, which, in young birds, shows a certain area of translucent unossified structure, a fact little known at that time, although now quite commonly used by collectors as a test in determining the age of individual specimens. The Potomac Valley Club did not issue any published record of its proceedings, and the data given above has been gathered from the minute-book of the Club, which is still extant.

Palmer was a man of powerful physique, particularly in his younger days, and was wont to indulge in long and difficult pedestrian feats with little show of fatigue. He was a loyal, good hearted and steadfast friend, though undemonstrative, and inclined to be stoical by nature. He accepted good or bad news as it came to him, without display of emotion, but there were times when he waxed enthusiastic and became animated over the discovery of a rare specimen in the field, or when discussing some problem on which he had fortified himself by careful investigation. He was a man of firm convictions and tenacious of his opinions, always ready to argue the point on any subject upon which he held decided views, and was even dominating and aggressive when on familiar ground.

Mr. Palmer's published contributions are somewhat scattered, and several of his earliest notes were printed in the 'Pastime,' a small and all but forgotten monthly periodical with natural history leanings, of which he was for a time one of the editors and proprietors. As some of the titles are now difficult of access, it has been thought best to give a full list of his publications.

LIST OF THE SCIENTIFIC PUBLICATIONS OF WILLIAM PALMER.

Avifauna Columbiana.

'Pastime,' III, No. 1, July, 1884, pp. 5, 6.

Avifauna Columbiana.

'Pastime,' III, No. 2, August, 1884, pp. 13, 14.

[A porpoise, *Tursiops tursio*, in the Potomac.] (Anonymous.)

'Pastime,' III, No. 2, August, 1884, p. 16.

[A cormorant on the Potomac, off White House Point.] (Anonymous.)

'Pastime,' III, No. 2, August, 1884, p. 16.

[Albino young robins.] (Anonymous.)

'Pastime,' III, No. 2, August, 1884, p. 16.

A Botanical Trip up the Anacostia. "By one of the Party."

'Pastime,' III, No. 4, October, 1884, pp. 25, 26.

The Ferns of Washington and Vicinity. (Anonymous.)

'Pastime,' III, No. 4, October, 1884, pp. 29, 30.

Arrival of Spring Birds.

'Pastime,' III, No. 4, October, 1884, p. 30.

[A shearwater on the Potomac.] (Anonymous.)

'Pastime,' III, No. 8, February, 1885, p. 8.

[The Prairie horned lark in Alexandria Co., Va.] (Anonymous.)

'Pastime,' III, No. 8, February, 1885, p. 11.

Abundance of *Parus atricapillus* near Washington.

'Auk,' II, No. 3, July, 1885, p. 304.

Occurrence of *Helminthophila leucobronchialis* in Virginia.

'Auk,' II, No. 3, July, 1885, p. 304.

Additions to the Avifauna of Washington and Vicinity. By Hugh M. Smith and William Palmer.

'Auk,' V, No. 2, April, 1888, pp. 147, 148.

Occurrence of Traill's Flycatcher near Washington, D. C.

'Auk,' VI, No. 1, January, 1889, p. 71.

First occurrence of the Philadelphia Vireo near Washington, D. C.

'Auk,' VI, No. 1, January, 1889, p. 74.

Notes on the Birds observed during the cruise of the United States Fish Commission schooner *Grampus* in the summer of 1887.

'Proc. U. S. Nat. Mus.,' XIII, No. 819, October 14, 1890, pp. 249-265.

Fate of the Fur Seal in America.

'Forest and Stream,' XXXVII, No. 15, October 29, 1891, pp. 287-288.

Do Wading Birds Swim?

'Nidologist,' I, No. 12, August, 1894, p. 175.

Plumages of the Young Hooded Warbler.

'Auk,' XI, No. 4, October, 1894, pp. 282-291, figs. 1-4.

The Ruff and Western Sandpiper near Washington, D. C.

'Auk,' XI, No. 4, October, 1894, p. 325.

An Asiatic Cuckoo on the Pribylof Islands, Alaska.

'Auk,' XI, No. 4, October, 1894, p. 325.

Four Additions to the Birds of the Virginias.

'Auk,' XI, No. 4, October, 1894, pp. 333, 334.

[Notes on the Pacific Walrus and its skin.]

Report of U. S. Nat. Mus. for 1893, 1895, pp. 50-52.

Photographs of Young Skimmers, by R. W. Shufeldt, With Notes on the Breeding Habits of these Birds by Mr. Wm. Palmer.

'Nidologist,' III, No. 3, November, 1895, pp. 26-28, 2 figs.

The Scissor-tailed Flycatcher in Virginia and Maryland.

'Auk,' XIII, No. 1, January, 1896, p. 83.

Second occurrence of the Lark Sparrow in Virginia.

'Auk,' XIII, No. 1, January, 1896, p. 84.

On the Florida Ground Owl (*Speotyto floridana*).

'Auk,' XIII, No. 2, April, 1896, pp. 99-108, pl. II, 2 text figs.

Thoughts on the New Check-List.

'Nidologist,' III, No. 8, April, 1896, p. 91; No. 9, May, 1896, pp. 102, 103.

Stone on the Molting of Birds. (Review.)

'Auk,' XIII, No. 3, July, 1896, pp. 240-243.

The Check-List again.—A Rejoinder.

'Nidologist,' III, No. 12, August, 1896, pp. 138, 139.

- Chimney Swift Feeding its Young.
'Nidologist,' IV, No. 2, October, 1896, p. 17.
A Note on *Buteo borealis lucasani* Ridgway.
'Auk,' XIII, No. 4, October, 1896, p. 342.
Breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia,
near Washington.
'Auk,' XIII, No. 4, October, 1896, p. 343.
The Wood Ibis in Virginia and Maryland.
'Auk,' XIV, No. 2, April, 1897, p. 208, 209.
An Addition to North American Petrels.
'Auk,' XIV, No. 3, July, 1897, pp. 297-299.
Bachman's Sparrow in Virginia.
'Auk,' XIV, No. 3, July, 1897, p. 322.
The Sitkan Kinglet.
'Auk,' XIV, No. 4, October, 1897, pp. 399-401.
The Tree Swallow Breeding in Virginia.
'Auk,' XIV, No. 4, October, 1897, p. 408.
Our Small Eastern Shrikes.
'Auk,' XV, No. 3, July, 1898, pp. 244-258.
The Ferns of Hemlock Bluff.
'Plant World,' II, No. 9, June, 1899, pp. 143-147.
A new locality for *Asplenium pinnatifidum*.
'Fern Bulletin,' VII, No. 3, July, 1899, pp. 70, 71.
Ferns of the Dismal Swamp, Virginia.
'Proc. Biol. Soc. Washington,' XIII, September 28, 1899, pp. 61-70.
The Avifauna of the Pribilof Islands.
'The Fur Seals and Fur-Seal Islands of the North Pacific Ocean,'
Part III, 1899, pp. 355-431, pls. xxxviii-xli.
Ecology of the Maryland Yellow-throat, and its Relatives.
'Auk,' XVII, No. 3, July, 1900, pp. 216-242.
False Trinomialism.
'Fern Bulletin,' IX, No. 1, January, 1901, pp. 13-15.
A Rich Locality.
'Fern Bulletin,' IX, No. 1, January, 1901, p. 18.
Deforested Cuba.
'Plant World,' IV, No. 2, February, 1901, pp. 21, 22, pl. 2.
The Scientific Name of the Southern Yellow-throat.
'Auk,' XVIII, No. 2, April, 1901, pp. 197, 198.
Warden's List of the Birds of the District of Columbia.
'Osprey,' V, No. 4, April, 1901, pp. 57, 58.
Cuban uses of the Royal Palm.
'Plant World,' IV, No. 6, June, 1901, pp. 107, 108.
The Blue-Gray Gnatcatcher.
'Osprey,' V, No. 6, June, 1901, pp. 86-88, 2 figs.

- Chapman on the Meadow Larks. (Review.)
 'Osprey,' V, No. 6, June, 1901, pp. 95, 96.
 The Malar Stripe of Young Flickers and the Molt.
 'Osprey,' V, No. 7, July, 1901, pp. 102-104, 1 fig.
 Norton on Labrador Birds. (Review.)
 'Osprey,' V, No. 7, July, 1901, p. 112.
 Some Birds of the Kissimmee Valley, Florida.
 'Osprey,' V, No. 9, September, 1901, pp. 131-133, 1 pl.; No. 10,
 October, 1901, pp. 147-149, 1 pl.; No. 11-12, November-December,
 1901, pp. 163-165.
 August Birds on Stony Man Mountain, Virginia.
 'Osprey,' N. Ser., I, No. 1, January, 1902, pp. 9-12.
 Macoun on Canadian Birds. (Review.)
 'Osprey,' N. Ser., I, No. 1, January, 1902, p. 20.
 Descriptions of Three new Birds from Cuba and the Bahamas. By Wm.
 Palmer and J. H. Riley.
 'Proc. Biol. Soc. Washington,' XV, March 5, 1902, pp. 33, 34.
 The Log Fern.
 'Fern Bulletin,' X, No. 2, April, 1902, pp. 37-41.
 Another use for the Royal Palm.
 'Plant World,' VI, No. 3, March, 1903, pp. 55, 56.
 Gyrostachys simplex in Virginia.
 'Proc. Biol. Soc. Washington,' XVII, December 27, 1904, p. 165.
 Successful Natural Parks.
 'Plant World,' IX, No. 1, January, 1906, pp. 8-11.
 Green and Red Stiped Lady Ferns.
 'Fern Bulletin,' XIV, No. 3, July, 1906, pp. 78, 79.
 Instinctive Stillness in Birds.
 'Auk,' XXVI, No. 1, January, 1909, pp. 23-36.
 Description of a New Species of Leatherback Turtle from the Miocene
 of Maryland.
 'Proc. U. S. Nat. Mus.,' XXXVI, No. 1669, April, 27, 1909, pp.
 369-373, pl. 31.

TRAPPING DUCKS FOR BANDING PURPOSES.

WITH AN ACCOUNT OF THE RESULTS OBTAINED FROM ONE
WATER-FOWL STATION.

BY FREDERICK C. LINCOLN.

Plates XI-XIV.

THE marking of migratory waterfowl presents a most interesting phase of bird banding work to those persons so fortunately located as to be able to give it a portion of their time. Among the many advantages of such operations is the relatively great importance that attaches to detailed studies of these birds, and the assurance of solution of some of the problems because of the many "returns" that the operator will be justified in expecting from his activities. True, the returns are in most cases from dead birds, in contrast to the numerous returns that may be secured from a single individual of the non-game species through the continuous operation of the regular small bird trapping station. This is, however, largely offset by the greater number of returns from the birds that are hunted for sport, which may equal fifteen to twenty-five per cent of the total number banded. And when systematic trapping has been definitely applied to these groups at a large number of stations, the returns will, of course, be even greater.

With these facts in mind, the best methods of operation become of paramount importance, and in the following pages the writer endeavors to present the methods of duck trapping that have been tried by different collaborators of the U. S. Biological Survey, with comments on their effectiveness. There is also included a resumé of the results that have been obtained through the activities of one of the most successful stations, that at Lake Scugog, Ontario, Canada.

Traps for waterfowl fall naturally into two classes—those designed for the river or surface feeding species, and those adapted to diving ducks. Each of these may in turn be divided into those

that are automatic, or which do not require the presence of the operator, and those that are under more or less continuous observation and that are manipulated from a blind.

Thus far the surface-feeding ducks have received more attention than have those that obtain their food by diving in a considerable depth of water, and in consequence virtually all of the traps described have been developed for use in catching such birds. It is of decided importance that this partiality be overcome in the near future because there is quite as much to be learned regarding the migrations and habits of the diving ducks as of the more easily trapped surface feeders.

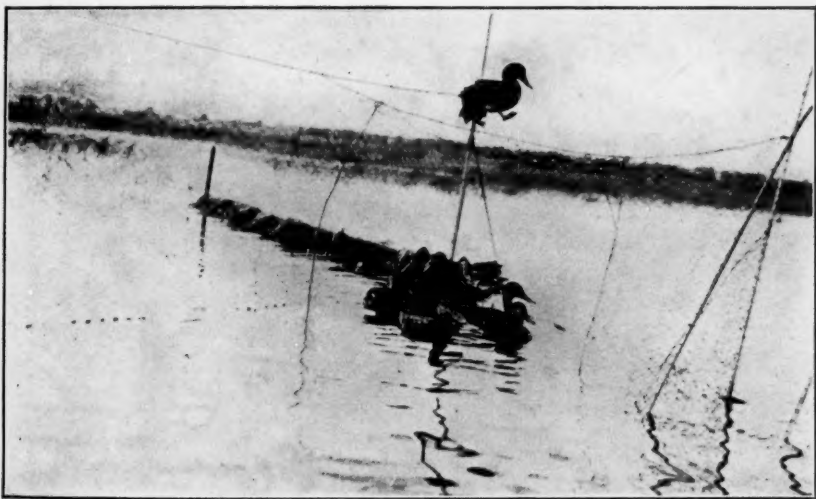
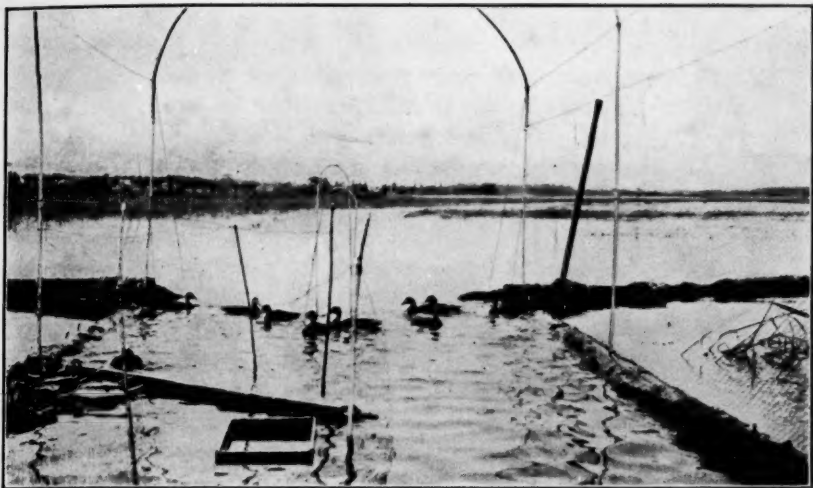
Automatic traps.—The principle of most automatic traps is that of "confusion," effected either by obstructing "wings" or by a simple adaptation of the funnel so successfully employed in the Government sparrow trap.¹ Mr. H. S. Osler of Toronto, Ontario, has developed a large trap of this type (See Plate XI) that has given exceptionally fine results. A raft, made by bolting planks to two cedar logs forty feet long and twelve feet apart, is employed for the foundation. Upon this is placed a framework of galvanized iron pipe covered with the regular two-inch hexagonal mesh poultry wire. Entrances are left at both ends and protected by short wings that serve to deflect any captured birds that might endeavor to escape. Doors are also provided which may be closed on the approach of the operator to band his captures. A small semicircular pen on one side near the center serves to confine a few live decoys. This trap is towed into position in a natural feeding area (in Mr. Osler's case a bed of wild rice) and the raft sunk below the surface of the water by covering the floor with mud. Mr. Osler's trap secured approximately 600 ducks of four species during the autumns of 1920 and 1921.

This is probably one of the best types of automatic trap on a large scale, and it will be readily apparent that the same general plan of construction may be followed for a non-automatic trap to be operated from a suitable observation point. Plate XII shows a trap of this kind that was built by the writer at Ray Lake,

¹ U. S. Department of Agriculture Circular No. 170, Contribution from the Biological Survey, *Instructions for Bird Banding*, by Frederick C. Lincoln.

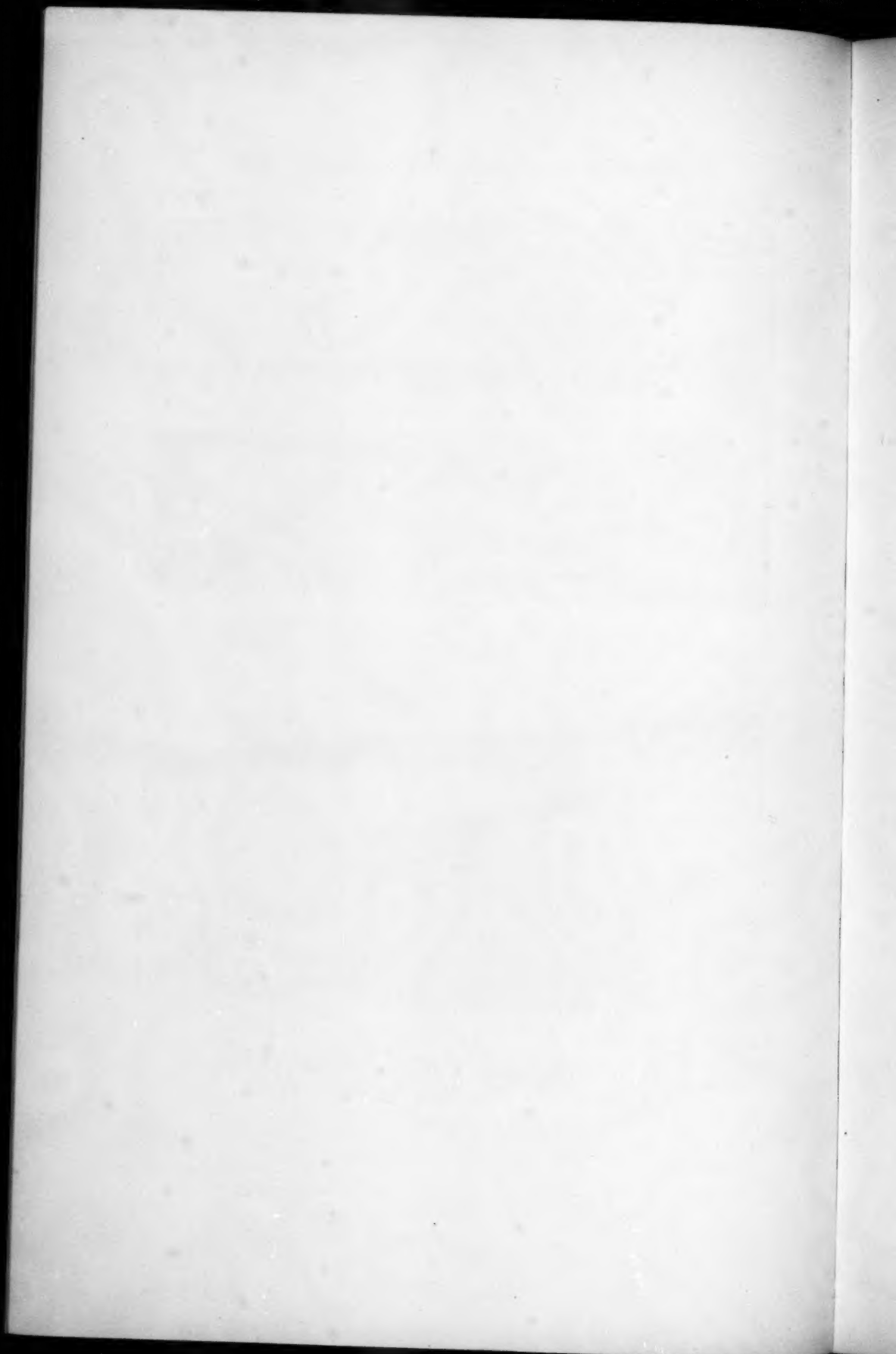
near Oakville, Iowa. The trap chamber, measuring twenty feet long, eight feet high and six feet wide, was placed on the shore of the lake in an area where large numbers of Mallards had been fed by an active conservationist, Mr. Allen Green. Half of the front was converted into a door hinged at the top with wire loops, and swinging outwardly. This was supported in an open position by a strong cord that ran over the top of the chamber to the veranda of a cottage seventy-five yards away. A forked stick, lashed horizontally to one wall near the bottom, served as a catch to lock the door after it had been released. In the rear of the chamber a piece of netting extending between the walls formed a pen that confined the decoys. The lake at this time was frozen over, but had open water been available the effectiveness of the trap would have been greatly increased by providing wire netting wings, extending from the entrance in a widely diverging angle. These would have been carried as far as possible into the water and should have had the effect of forcing swimming birds in the direction of the door. Small funnel-like openings back of the wings at their junction with the trap chamber would permit the entrance of those birds that might work toward the trap from behind the wings. These directing wings may be used to advantage with almost every kind of trap.

A large automatic trap of the funnel type that was designed by the writer is shown on Plate XIII, fig. 1. This trap gave exceptionally fine results during recent (March, 1922) work in the Illinois River marshes. As used there, it was built in about two feet of water and consisted of a pen made by covering a framework of willow saplings with ordinary two-inch poultry wire, the bottom being secured by burying the netting deep in the mud with a number of forked stakes. The shape of the chamber was that of a deeply indented heart or water-lily leaf, the funnel forming the indentation, thus leaving large "pockets" on either side. Captured ducks will gather in these pockets and avoid the opening of the funnel which was almost or quite in the center of the chamber. Instead of "wings," a single "lead" or fence of wire netting was extended straight out from the exterior opening of the funnel for a distance of fifty or sixty feet. This was used because of the fact



PHOTOS BY H. S. OSLER.

1. LARGE AUTOMATIC TRAP, LAKE SCUGOG, ONTARIO.
2. REMOVING A DUCK FROM AUTOMATIC TRAP.



that the trap was set in the midst of a natural feeding area and not on a shore line.

Two of these traps caught a large number of birds, the record catch being shown in the illustration which amounted to practically one hundred Mallards, Pintails and Black Ducks. Considerable success was also obtained in this region by grouping several of the common "fyke" nets in shallow water and baiting the area with shelled corn. These nets, however, have a serious disadvantage in that the chambers are small and there is danger that so many birds may work into the second chamber as to force some under water and drown them. Plate XIII, fig. 2 shows a catch of Mallards and Pintails on one of these nets. Three nets were used in making the "set."

Another trap of the automatic variety has been developed by the writer for use where local conditions, such as a marsh of cat-tails or reeds, demand one of smaller size. They may, in fact, be termed portable traps, as distinguished from those that when once built are more or less permanent. A box or chamber measuring five feet long by two feet square is built from two-foot poultry wire. No corner posts are used, the stiffness of the netting giving ample strength, and the slight visibility that results from the absence of heavy supports is a feature highly desirable. Three pieces of netting are used, two sections five feet long for the top and bottom, and a third, about sixteen feet long, for the sides, back, and funnel. The funnel is formed by carrying the ends into the chamber in front, fastening them together for about half their width and spreading them apart at the bottom with a piece of heavy wire bent to form an inverted "U." All connections or joints are secured with wire by a pair of pliers. The jagged ends of the netting are left projecting into the chamber, which arrangement will effectually prevent captured birds from making their exit. Such traps are very light, and their simple construction and ready portability will permit their use in a wide variety of situations.

Non-automatic traps.—Where the ducks may be baited to the shore, a trap that throws a net is most satisfactory. One of this kind has been successfully used by Mr. Joseph Pulitzer, Jr., of

St. Louis, Missouri, at the Cuivre Island Club, Missouri, and at Bar Harbor, Maine. This is another of the non-automatic types, the principle involved being a development of the old spring-pole trap that was used so effectively in trapping Passenger Pigeons for the market. Two straight saplings, about forty feet long and five or six inches in diameter across the butt, are set firmly into the ground about seventy-five feet apart, at right angles to and back from the shore line. The tips should be elevated five or six feet, and the position of the poles maintained by forked posts set rigidly into the ground about mid-way of their length. The tips are connected by a piece of heavy wire (about number 8 or 10), and to this the net is attached. For a trap of the size described, the net should be about twenty feet square, although a larger net might be thrown to advantage by increasing the size of the spring poles. Two triggers or releases are provided which should be located about twenty-two feet apart in the area between the poles and about the same distance back of the normal position of the net wire. Plate XIV, fig. 2 shows the construction of these releases. Broom handles make excellent trigger poles, which are notched an inch or two from one end to hold the net wire. The supporting cleats, pull wire (lower center), net pile, and a portion of the baited area are also visible in this picture. The trap is set by pulling the net wire back to the trigger, where it is held in place by the notches in the trigger poles, the upper ends of which slip under the projecting cleats. This operation serves to bend the spring poles sharply inward and when fully set the net wire should form a straight line between the triggers with the net piled up smoothly behind it. The opposite end of the net is, of course, secured to the ground by stakes. A wire running from one of the trigger poles to a convenient blind, is pulled to release the trap. This will cause a simultaneous movement of the opposite pole, which, no longer held in place by the cleats, rises vertically, the throw wire slips off and flies forward, pulling the net with it. With powerful poles this action is extremely rapid and there is no time for a duck to escape. Plate XIV, fig. 1 shows the trap set at Cuivre Island, in which the bent spring poles, triggers, and

line of bait in front of the net are clearly visible. The live decoys used may also be observed at the shore line below the bait.

As stated previously, the trapping of diving ducks presents greater difficulties than of those species that feed on the shore or in comparatively shallow water. It should be remembered, however, that diving ducks usually dive when alarmed, and it is therefore doubtful whether an automatic trap would be advisable, as they might kill themselves if allowed to remain prisoners for any length of time. This is a matter that actual experiment must determine, for it is obvious that an automatic trap, if practical, will yield much greater results.

At the present time the most satisfactory trap for these birds is the one used by Dr. A. A. Allen of Cornell University, on Cayuga Lake, New York. In a natural feeding ground a three-sided pen is built of galvanized poultry wire. Iron pipes make the best corner posts; and care must be taken that the netting fits snugly to the bottom. About two feet of water will be a sufficient depth, and the netting should project a corresponding distance above the surface. No top is necessary because of the fact that diving ducks can not leave the water as readily as Mallards, Pintails, and other river ducks, but, instead, require a long start across the surface. As these birds will hesitate to swim under anything, this absence of a top has a decided advantage; and for the same reason the trap door that closes the fourth side should lie flat on the bottom when the pen is open. This door is best made by covering a frame of small gas pipe with the wire netting. A cord or wire, run to a suitable observation point, is used to raise the door and close the trap.

The matter of bait must always be given careful attention. At times, particularly during the summer, duck trapping may become the most disheartening kind of work, because of the actual indifference of the birds to cereal baits at a time when natural food is probably abundant. Generally speaking, corn (preferably cracked) will be found to be the best bait, but various small grains such as rice, wheat, kaffir corn, and barley may at times be used to advantage. Decoys are always advisable, since, as it usually takes from a few days to two weeks for wild ducks to

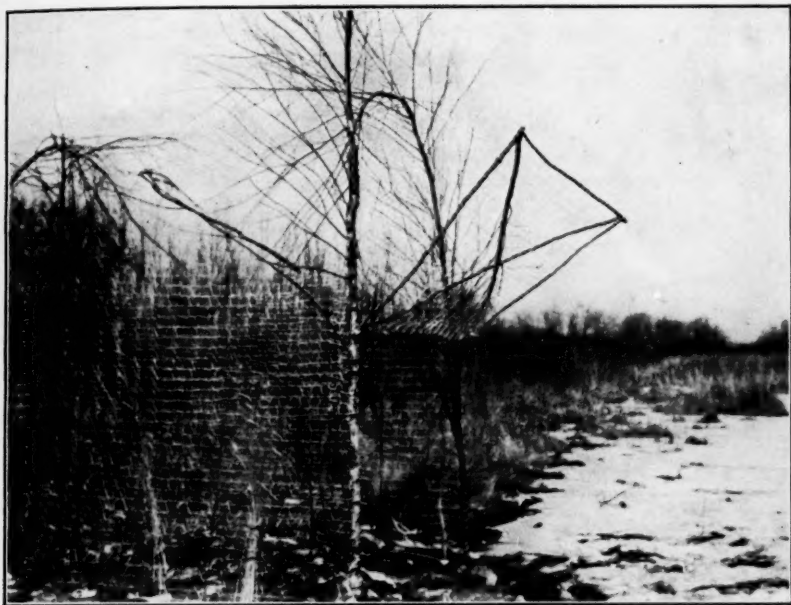
become sufficiently accustomed to the presence of the superstructure of the trap to venture near the bait, a few live decoys may prove of the greatest value in gaining their confidence.

Results at Lake Scugog, Ontario.—Turning now to the relative importance of the systematic banding of waterfowl, a considerable amount of valuable data will be found in the results of the operations of Mr. H. S. Osler of Toronto, Ontario, in 1920.

Lake Scugog, where the trapping has been done, is a small body of water lying about sixteen miles due north of Lake Ontario, and separated from it by a continuous ridge, which reaches its crest four miles south of the former lake. This ridge attains a height of 800 feet above Lake Ontario but only 300 feet above the surface of Lake Scugog. With its surrounding marshes of wild rice and other aquatic plants, the lake seems to offer excellent opportunities for ducks to feed and rest before starting on the long flight to the south. It is also utilized to some extent as a breeding ground.

According to the observations of Mr. Osler, the great body of ducks moves southward at one time, generally about the middle of November, and coincident with the first heavy wind from the north or northwest. Prior to this major flight, scattering small flocks and isolated pairs drift southward in short flights. This is also attended by continuous influxes of migrants from the great inland breeding areas, each northerly wind bringing down its quota. These observations, based on several years experience in the Scugog marshes, have been fully verified by the "return" records of the banded birds.

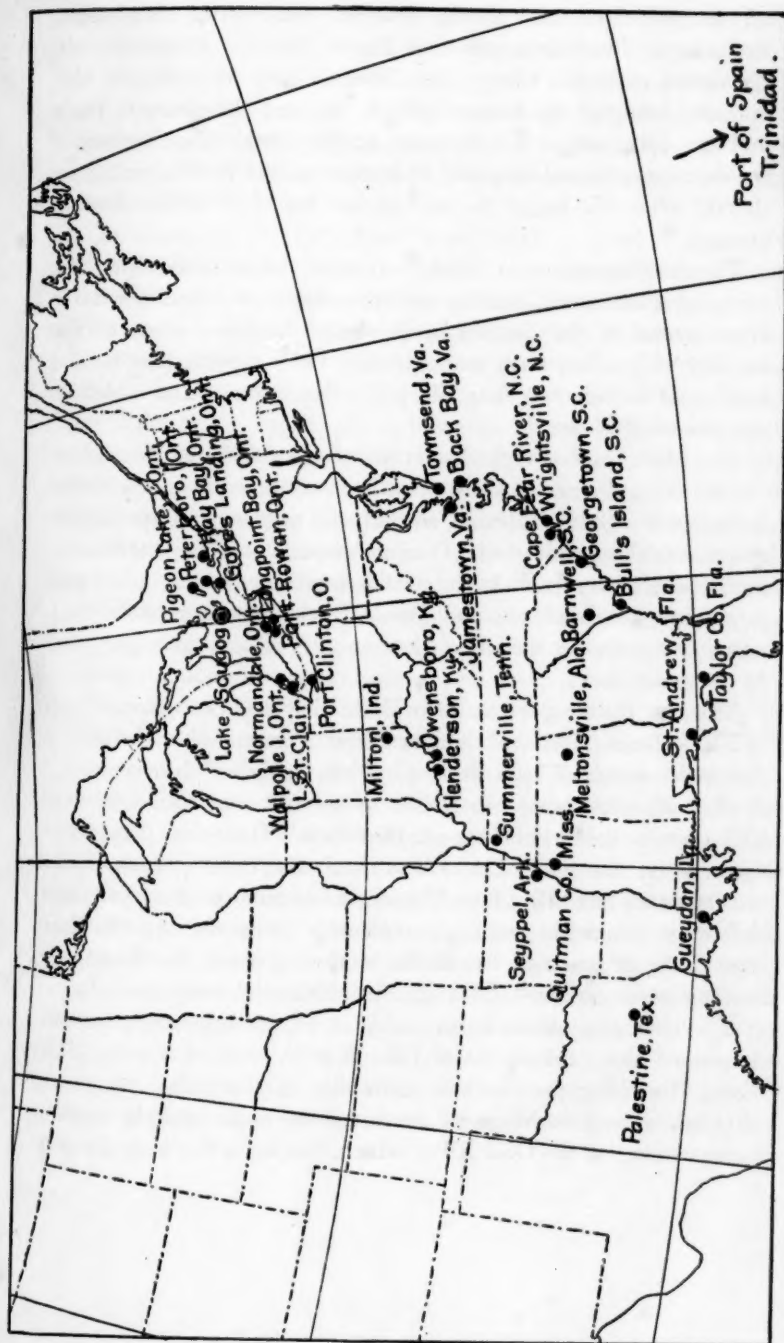
Trapping operations were begun about September 1, 1920. At this time the weather conditions were fair with moderate winds from southwest to north and the ducks then present (principally Mallards and Black Ducks) represented the local breeders with their progeny, with probably the van of those from the interior. The great bulk of the more northern-bred ducks arrived in September and October during a continued spell of mild weather, which afforded them an excellent opportunity to rest and feed in the Scugog and adjacent marsh lands. During these two months the trap was in full operation, the catch being 206 ducks of four



PHOTOS FROM BIOLOGICAL SURVEY.

1. LARGE NON-AUTOMATIC TRAP WITH DOOR OPEN.
2. LARGE NON-AUTOMATIC TRAP WITH DOOR CLOSED.





species, together with Rails, Florida Gallinules, Kingfishers, Red-winged Blackbirds and one Pigeon Hawk. Practically all the ducks captured were either Black Ducks or Mallards, the majority being of the former species. Several Blue-winged Teals and two Ring-necked Ducks made up the total. The freezing of the marshes stopped trapping operations about November 19, or shortly after the larger flocks had left for their winter feeding grounds.

The shooting season in Ontario opens at the same time that the trapping was started, that is, on September 1, so it was inevitable that several of the banded birds should be killed close to the locality where they were marked. Mr. Osler reports that he had rumors of four or five thus killed, the band numbers of which he was unable to learn.

But when the big flight began about the middle of November, the shooting season was also open in every State from the Great Lakes to the Gulf of Mexico, so that the migrating birds had to run a veritable gauntlet of sportsmen, from whom the return records have been received. In considering these data it seems well to discuss the Mallards and Black Ducks together, since they seemingly followed the same route and in all probability moved in the same flocks.

The first band reported to the U. S. Biological Survey was from a Black Duck killed on October 30, at Pigeon Lake, Ontario, a few miles north of Lake Scugog. This, being a "short return," is of scant importance other than to indicate that the birds were still more or less stationary on that date. However, three days later, or on November 2, the next band, also from a Black Duck, was reported from Hay Bay, Ontario, a few miles to the south; and following this with gratifying regularity came the reports that traced the progress of the flocks in their journey to the winter feeding areas on the Gulf and South Atlantic coasts.

The course of all these migrating birds was apparently south-westward along the shores of Lake Erie by way of the St. Clair flats. Reaching the southern extremity of that lake, the route divided. The great majority continued the southwesterly course, cross-country to the Ohio River, which, flowing in the same general

direction, served as a highway to the Mississippi Valley. The second group of birds, which had separated from the main body in the vicinity of the southern shores of Lake Erie, shifted their direction of flight to the southeast, crossed the Alleghenies and reached the Atlantic coast by way of Chesapeake Bay. A study of the accompanying map will illustrate more graphically the routes taken by these two groups.

In discussing the data from these ducks, it becomes necessary to recognize a third group, which for some reason did not leave the region where they were banded until a much later period. This group was unquestionably small and there is, of course, the possibility that it was composed more or less of crippled birds or those that for some other physical reason were unable to make the flight to the south. It is, however, of some significance that Mallard No. 5104, banded on November 6, was killed on Long Point Bay, Ontario, on November 15, and that No. 5101, banded at the same time, was killed at the same place by the same hunter, on December 6. The season in Ontario closes on December 14, and no later records were secured, but in view of this single bit of information, it seems not improbable that a certain percentage of the birds at Lake Scugog in the fall were still in the contiguous country at the close of the year.

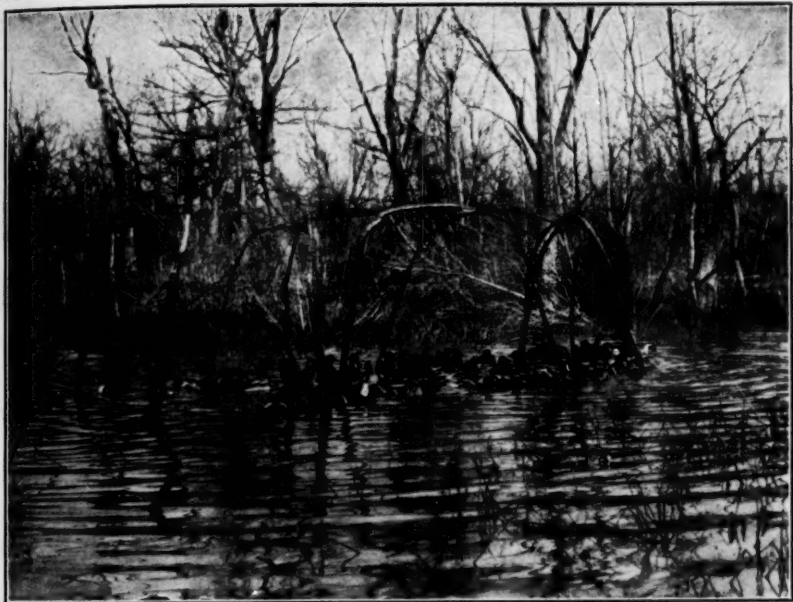
In studying the distribution of these "returns" it is worthy of note that with one exception (Meltonville, Alabama) all the ducks were killed either along the Mississippi Valley or the Atlantic coast. It is also interesting to observe that, although both the Mallard and the Black Duck are common along the coasts of New Jersey, New York, and New England, only one of the Scugog birds was taken there, indicating that most of the ducks of these species that frequent the coasts and marshes in those sections, either breed in the region or come from northern territory nearer the coast. Southward from Back Bay, Virginia, banded ducks were reported in a fairly well-connected chain along the coasts of Virginia and North and South Carolina to Florida, where the records joined those made along the Mississippi Valley highway. Most of the Atlantic coast records are for December, January, and

February, at which time the birds were probably on their preferred winter feeding grounds.

Ducks of species other than the Mallard and Black Duck that were banded by Mr. Osler were considered too few to be of any material consequence, so it was a matter of surprise when return records for both of the Ring-necked Ducks were received. Both were killed on the Atlantic coast, one at Back Bay, Virginia, and the other in Georgetown County, South Carolina. In view of the fact that this species is not common on the Atlantic coast but is much more numerous during migrations in the Mississippi Valley, the presence on the Atlantic coast of the only two banded at Lake Scugog is of decided interest. They had probably reached the coast by the same route used by the Mallards and Black Ducks, if not actually with them.

Probably the greatest interest that attaches to any one of Mr. Osler's ducks is that of Blue-winged Teal No. 4576. This little duck was banded on September 24, in company with another of its own kind and eight or ten Black Ducks. Two months and seven days later it was killed by a hunter in the Caroni Swamp, near Port of Spain, Island of Trinidad. The flight made by this bird must have been close to 3,000 miles. For many years it has been known that some of the Blue-winged Teals and certain other ducks that breed in North America winter in South America. The presence of this species on the Island of Trinidad has been particularly noted, but there has been no information available to show from what part of the northern continent the birds came. The record of this individual is therefore of decided interest and value. The band was returned to the U. S. Biological Survey by the American Consul through the State Department.

To the conservationist the case of the Scugog ducks will afford interesting data on the mortality sustained by a given number of birds in one shooting season, which are of peculiar significance in view of the figures recently published of the number of ducks killed in one State during the open season. In 1920, Mr. Osler banded about 225 ducks of four species, all more or less sought by sportsmen, and three of the four particularly prized as table birds in almost every section of the country. During the few

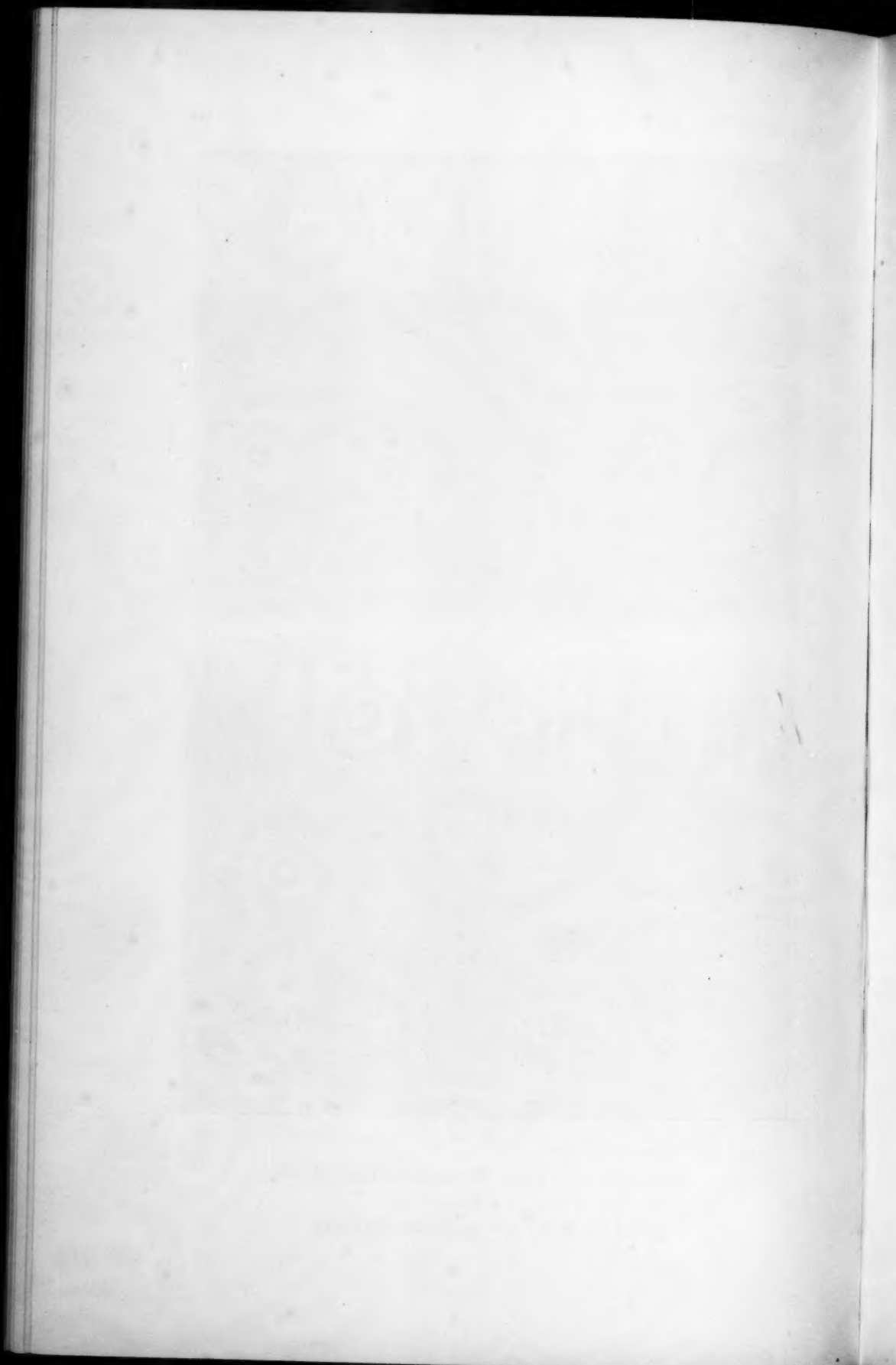


PHOTOS FROM BIOLOGICAL SURVEY.

1. AUTOMATIC PEN TRAP, WATER-LILY LEAF SHAPE.

2. 'FYKE' NET USED AS A DUCK TRAP.

BOTH ON THE ILLINOIS RIVER MARSHES.

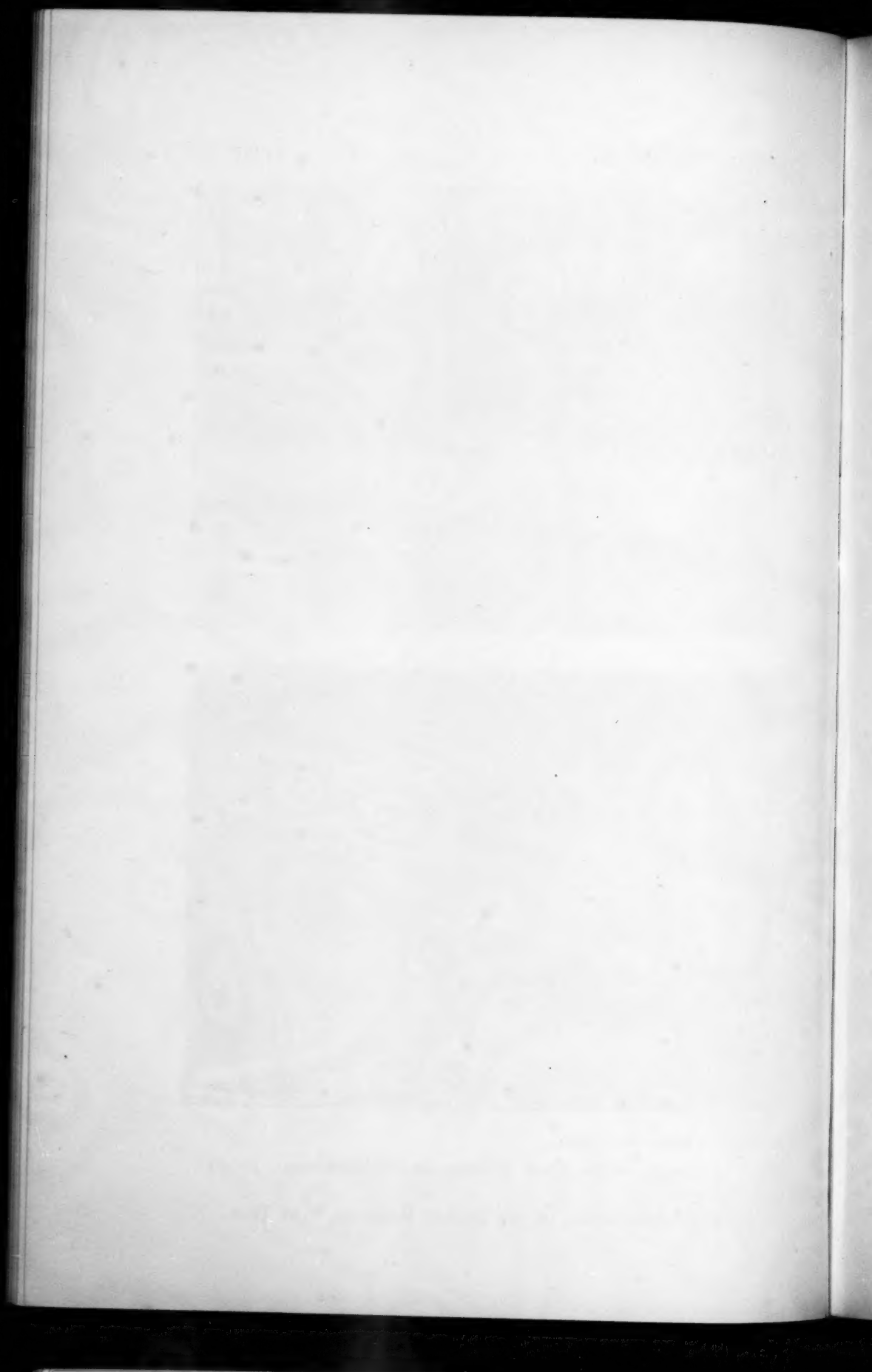




PHOTOS FROM BIOLOGICAL SURVEY.

1. LARGE SPRING TRAP (CUIVRE ISLAND, MISSOURI), FRONT VIEW.

2. DETAILS OF ONE OF THE TRIGGER RELEASES, SAME TRAP.



months of the open season of 1920-1921, at least thirty-five of these, or about sixteen per cent were killed. (These include those reported by Mr. Osler as killed at Lake Scugog, but of which the complete data were not secured.) If these figures or the figures that will later be secured through the comprehensive work now being developed by the U. S. Biological Survey may be considered as average, then an accurate computation of the number of ducks killed during any one shooting season may provide a satisfactory index to the total number of such birds in the country at that period. The great possibilities of the work should be readily apparent.

The following table contains the data for all "returns" of 1920 Lake Scugog ducks that were reported up to March 1, 1921.

Anas rubripes and *Anas platyrhynchos*

Number.	Date Banded.	Date Recovered.	Locality where Recovered.
4506	Sept. 3, 1920	Sept. 6, 1920	Lake Scugog, Ont.
4656	Oct. 1, 1920	Oct. 23, 1920	Lake Scugog, Ont.
4674	Sept. 18, 1920	Oct. 30, 1920	Peterboro, Ont.
4525	Sept. 14, 1920	Nov. 2, 1920	Hay Bay, Ont.
4610	Sept. 26, 1920	Nov. 4, 1920	Caesarea, Ont. }
4697	Oct. 23, 1920	Nov. 7, 1920	Caesarea, Ont. } Lake Scugog
4668	Sept. 19, 1920	Nov. 12, 1920	Lake St. Clair, Ont.
4670	Sept. 18, 1920	Nov. 15, 1920	Rice Lake, Ont.
5104	Nov. 6, 1920	Nov. 15, 1920	Port Rowan, Ont.
4519	Sept. 9, 1920	Nov. 16, 1920	Normandale, Ont.
4518	Sept. 9, 1920	Nov. 16, 1920	Port Clinton, Ohio
4698	Oct. 23, 1920	Nov. 18, 1920	Lake Scugog, Ont.
4602	Sept. 25, 1920	Nov. 18, 1920	Cape Fear River, N. C.
4581	Sept. 24, 1920	Nov. 19, 1920	Milton, Ind.
4612	Sept. 26, 1920	Nov. 19, 1920	Henderson, Ky.
4630	Sept. 20, 1920	Nov. 20, 1920	Walpole Island, Ont.
4688	Oct. 4, 1920	Nov. 23, 1920	Seyppel, Ark.
4611	Sept. 26, 1920	Nov. 23, 1920	Summerville, Tenn.
4597	Sept. 25, 1920	Nov. 26, 1920	Palestine, Texas
4640	Sept. 30, 1920	Nov. 27, 1920	Wrightsville Beach, N. C.
4592	Sept. 24, 1920	Nov. 29, 1920	Taylor County, Fla.
4616	Sept. 27, 1920	Dec. 4, 1920	Quitman County, Miss.
5101	Nov. 6, 1920	Dec. 6, 1920	Long Point Bay, Lake Erie, Ont.
4524	Sept. 14, 1920	Dec. 7, 1920	Gueydan, La.

Number	Date Banded	Date Recovered	Locality where Recovered
36986	Sept. 10, 1918	Dec. 22, 1920	Townsend, Va.
4549	Sept. 15, 1920	Dec. 28, 1920	Owensboro, Ky.
4543	Sept. 15, 1920	Jan. 1, 1921	Jamestown, Va.
4570	Sept. 18, 1920	Jan. 13, 1921	Georgetown, S. C.
5103	Nov. 6, 1920	Jan. 15, 1921	St. Andrew, Fla.
4568	Sept. 18, 1920	Jan. 29, 1921	Bull's Island, S. C.
4598	Sept. 25, 1920	Feb. 5, 1921	Meltonsville, Ala.
4637	Sept. 29, 1920	Feb. 20, 1921	Barnwell, S. C.

Marila collaris

4700	Oct. 29, 1920	Nov. 23, 1920	Back Bay, Va.
37304	Sept. 24, 1920	Jan. 5, 1921	Georgetown County, S. C.

Querquedula discors

4576	Sept. 24, 1920	Dec. 9, 1920	Port of Spain, Trinidad, B. W. I.
------	----------------	--------------	-----------------------------------

U. S. Biological Survey, Washington, D. C.

BIRD-BANDING AT THOMASVILLE, GEORGIA, IN 1922.

BY L. R. TALBOT.

Plates XV—XVII.

THIS story tells of the bird-banding experiences of a novice. That is, I was a novice when they began on the twelfth of March, although a month later, in view of the number of birds handled, I felt like a veteran. And in that one fact lies the point that I wish to emphasize at the outset: that one does not need to be an expert in bird-banding, or a professional ornithologist, in order to take up this new and fascinating and most important phase of bird-study. Anyone with a minimum of time and a love of birds can by this means add to his own enjoyment and knowledge, and can help the cause of scientific bird-study and protection.

On March 1, 1922, bird-banding was, so far as I was concerned, largely a myth. Before the end of the month it had become, for

a while at least, the very center of my life; all my plans were conditional upon their effect on my work; a walk, a ride, a swim, a dinner engagement, all were timed so as not to interfere with the really important thing in life,—the periodical tour of the traps. I literally banded birds while I ate, as you shall see; and no one with a bit of enthusiasm in his make-up will doubt me when I say that I banded them in my sleep.

I had joined the New England Bird-Banding Association a few weeks before, and in due time had received my permits from Federal and State governments. I had pledged myself to band at least one bird this year; and I wondered whether I should be able to keep that pledge. I was frankly skeptical. I have more than kept it; in fact, I think I might ask to be retired on a pension! But I shall not; the work is too interesting for that. I shall keep it up wherever and whenever it is possible.

A bit of personal narrative is necessary that the reader may understand how a few short weeks had brought about such a change. Mr. S. Prentiss Baldwin, whose work in bird-banding is too well known to require extended comment, was unable to go to his usual trapping station in Thomasville, Georgia, this year. But to him and to others it would have seemed almost a crime if banding operations had been omitted on that plantation where so much has been accomplished. Someone must go down there and carry on. I had the good fortune to be the man. That is the whole story.

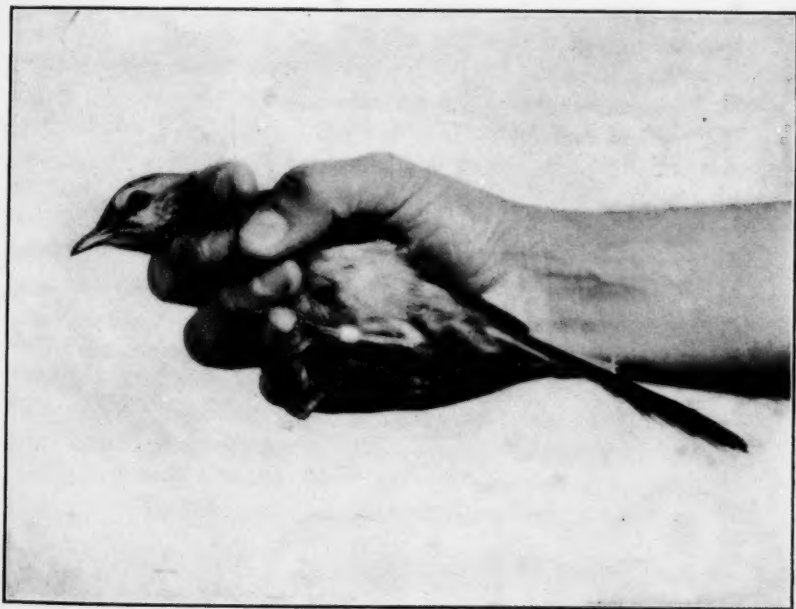
I accepted the invitation with mingled feelings. I had never banded a bird, it is true. Yet with that combination of recklessness and a sort of "the Lord will provide" feeling that animates most of us at times, I went. But I must confess that I had fears and forebodings. I feared that I might injure the birds through careless, inefficient handling. I feared that I might hurt them, or even kill them, by banding them incorrectly. I was afraid I might not be able to band them at all, that I should be helpless when I attempted to hold them, and that they would get away with nothing to show for the experience. I wondered whether I should be able to persuade the birds to go into the "gathering cage"; should I not find it necessary to open the trap and let them

go after all? These fears look ridiculous to me now, but they were genuine at the time.

Even if I should succeed in handling the birds and putting on the bands, should I not frighten them so that they would never again enter my traps, or anyone else's, for that matter? If that were the case, my results would be pretty meagre. The story of my repeats, told further on in this article, will answer this question.

And last, but perhaps most important of my forebodings, I wondered whether any birds would really go into the traps—my traps, once they were in operation. They did go in. There was no doubt about that. The traps were set up and ready for visitors at about 11 o'clock, March 12. An hour and a half later I banded six birds and took one "return," a Chipping Sparrow banded by Mr. Baldwin last year. Before night I banded nine more, making a fair total for a short first day. And they kept going in. My work at Thomasville extended over a period of thirty days. During that time I banded 313 and took 43 returns—birds banded in previous years, while the grand total of birds handled, including "repeats," or those that went back into the traps on the same or succeeding days after the original appearance, was 1804.

As to my fears. Of course I had to learn by experience and acquire a facility in handling birds. I know now that I did not handle them quite so well the first day or so as I did later. But I can honestly say that the extent of injuries due to my inexperience and awkwardness was negligible. Since "confession is good for the soul," I will explain. One Chipping Sparrow left his tail feathers in my hand when I tried to regain my hold after he had struggled and escaped. In spite of directions, I had failed to realize properly that once a bird slipped out of the hand, the operator must not try to catch him again. The incident not only taught me this, but also led me to be more careful in holding a bird in the first place. The Chipping Sparrow bore me no ill-will, however; he came back repeatedly and before I left Thomasville I had the satisfaction of seeing that his new tail feathers were almost full-grown. A Mockingbird lost a part of his tail feathers in much the same way; I felt especially sorry for him, for the tail seems



1. A CHIPPING SPARROW VERY MUCH ALIVE AND QUITE AT HOME IN THIS POSITION.
2. MOCKINGBIRD. NOTE ITS INSTINCT TO PERCH.

such an important part of a Mockingbird! But he, too, came back several times and showed me the new feathers he was growing in place of the ones lost.

Then too, during the first day or two I made several bands too tight. Birds that came back later showed evidences of my mistake. In some cases I was able to adjust the band, but generally it seemed wiser to leave it alone rather than risk breaking the leg. I am convinced that there is far more danger of a band being too tight than of its being too loose. In three cases the tarsus broke and it was necessary to amputate the foot. But, while I do not recommend having one's foot amputated as a cure for all ills, it is a fact that those three Chipping Sparrows gave every indication of being quite as well able to take care of themselves as before, and they obviously suffered no pain.

Why have I told these incidents? Would it not be better psychology to say nothing about them? For I am well aware that most, if not all bird-lovers feel an abhorrence at the thought of injuring a bird in any way. That is exactly my own feeling. And that is why I pass on these experiences, that others may profit by them, may know just where the dangers lie, and may have a more nearly perfect record than I had, perhaps 100 per cent. Do not say: "I shall not band birds if there is the remotest possibility of my injuring even one of them." Say rather: "I will band all I can, using the utmost care, and profiting by others' experience."

It should be remembered that the good results, both in scientific knowledge of ornithology and in actual protection and benefit to the birds themselves, far out-weigh the slight injuries which are possible, but not inevitable. And after all, five out of 1804 is a small proportion. And as already stated, these five were all well and contented when I left them several weeks later.

Did birds ever escape from my hand? Yes, once in a while. If for any reason I was trying to hurry, or if I became careless in holding a bird, he was likely to take advantage of the opportunity to regain his freedom. And, let me repeat, if the bird has once freed himself, the operator must not attempt to grasp him again. Yes, occasionally birds do escape, but only a very small proportion of the total number handled. Let no one worry about that.

How about driving the birds into the gathering cage? Well, that is part of the fun. It is not always easy to persuade people to do a thing of the desirability of which they have not become convinced; and sometimes a bird fails to understand why he is expected to go through a small opening which, apparently, leads nowhere and does not help matters in the least. But it is right here that different species, and even different individuals of the same species, show their "personality," if I may use that term. It is most fascinating to watch their behavior in the traps. And with patience, the operator always succeeds; there is never any occasion to give up in despair.

The birds do not become frightened. Of course they become restless when they stop eating and first discover that they are imprisoned. They wander back and forth seeking an exit, but there is no reason to believe that they really have any fear. Birds that come back every day for two or three weeks, and sometimes four or five times a day, are not badly frightened. Surely we need not worry about Chipping Sparrow No. 22824, who entered the traps six times in a single day, or No. 22735, with a record of forty-three repeats, five in a single day. One Chipping Sparrow, No. 22849, repeated fifty-four times in twenty-two days. And on several occasions I released a bird at one trap only to find him in the next one that I visited, fifteen minutes later. No bird that is frightened will lie flat on his back on the operator's wide-open hand, absolutely free to fly away, but evidently perfectly contented. This was not an occasional performance, but occurred repeatedly. One Chipping Sparrow remained on my hand five minutes and then flew away only because I forced him to. (Plate XV, fig. 1.) One Blue Jay, after lying on his back, perched on my forefinger, then swung himself around like a parrot, and hung there upside down, without my touching him in any way.

As more and more people take up this work, in stations all over the country, an increasing number of "returns" will be reported. Among them I am sure someone will find some of my old friends, such as Field Sparrow No. 22782, Chipping Sparrow No. 22781, (with a record of forty-one repeats), Mockingbird No.

57729, Cardinal No. 57735, or Blue Jay No. 57752, referred to above.

The totals of birds handled in a day fluctuated. The smallest number was ten, on April 7; the largest, one hundred and ninety-two, on March 21. Of course the fluctuation was due, in part, to chance; the birds did not happen to come to the traps in such numbers on some days as on others, or having come there, for some reason did not happen to go inside. But there are two definite explanations for this great difference in the days' totals. First, migration, the very thing that bird-banding is helping us to study. On March 24 I took 120 birds; the next day only 49. On the 24th the usual number of Chipping Sparrows had been flying around; on the 25th, very few were seen, and since they are by far the most largely represented species in my report, their relative abundance or scarcity was directly reflected in the total of birds trapped on any given day.

The second reason for the variation is important. If one puts too much food outside the trap, the birds will find all they want to eat there and leave without going inside at all. After the first few days, when my totals had been satisfactory, on March 17 I took only seventeen birds, in spite of the fact that there were a great many all around. Investigation showed that I had inadvertently sprinkled bait pretty liberally in front of the traps. So at dusk, when I baited them for the next day, I went to the other extreme: I put only a small handful of chick feed and only a very few crumbs outside, and increased the amount just inside the entrance. The next day I had 94 birds, and then 92 (on a day when the traps were not used after 3:30 p. m. on account of showers), 119, 192, 187, and so on. Thereafter on several occasions I was able to trace a drop in the number of birds to a relative increase in the liberality with which I had sprinkled the bait outside. I even tried experiments which tended to bear out my observations, leaving more food in front of one trap than another.

My large number of "repeats" was due mainly to the fact that as a rule I visited the traps frequently, five or six times some days, occasionally even oftener. This is not necessary except when one is likely to take nesting birds, but I had the time and found

it interesting. The more often I handled the birds, the more I learned about their habits, the better I became acquainted with them. And when there were eighteen birds in a single trap together, a thing which happened at least twice, it was high time to let them out and begin over again, even although some of them did go right back.

I banded birds of seventeen species, as follows: Mourning Dove, Red-bellied Woodpecker, Blue Jay, Florida Blue Jay, White-throated, Chipping, Field, and Song Sparrows, Slate-colored Junco, Towhee, White-eyed Towhee, Cardinal, Myrtle and Palm Warblers, Mockingbird, Brown Thrasher, and Hermit Thrush. The Field Sparrow, Song Sparrow, and Mourning Dove were the first representatives of these species to be banded at this station.

The Mourning Dove (Plate XVII, fig. 1) is especially interesting, for he was taken with an ordinary sparrow trap, although he is really far too large for it. In fact, he was apparently unable to go through the opening from the first compartment to the second, and I was obliged to take him by lifting the trap slightly and reaching into the first compartment, which has no bottom, a rather difficult feat, since it is almost impossible to cover all the space thus left open, and the bird has a good chance to escape.

All of the above birds, with the exception of the woodpecker, may be classed as ground-feeders. Most of them are seed-eaters, but not all; several of them normally look for a quite different sort of food. Most, if not all, prefer the bread to the chick feed, although the latter is necessary to attract them in the first place. The Red-bellied Woodpeckers seemed out of their element eating bread crumbs on the ground, yet one that was banded at ten o'clock was taken in another trap about 100 yards away at 1:30 the same day. It was amusing to watch them walk upside down on the top of the trap, pecking at the wires, and then to see them try to peck my fingers as I attached the band.

A visitor, to whom the work was a novelty, expressed the thought that it must be tiresome to handle the same birds over and over again. I imagine this idea is general among those to whom banding is still mainly a theory. They wonder whether this phase of the work has any real value. The banding of a new bird, or a

return record, has more value, naturally. But the repeat record also is worth while. One never knows when he may record a given bird's last appearance at the station. And when many stations are being operated all over the country, there will be unlimited possibilities for studying migration through a comparison of dates; then even the hour at which the bird was last taken will have a significance.

For instance, Chipping Sparrow No. 22807 was banded March 18. He was taken on March 19, 20 (3 times), 21, 22, 24, 25, 26, 27, 28 (twice), and 30. What became of him after that? Of course he may have been killed by a hawk or a shrike, or he may have died from some other cause. Perhaps he merely desired a change of diet! But it seems far more likely that during the night of the thirtieth he went on toward the north. Well then, how far did he go? Where was he the next day? How long did he stay there? Where did he finally settle down for the summer? What other Chipping Sparrows were with him? That is, did this bird and others banded on March 18, or near that time, continue the migration together?

Chipping Sparrow No. 22759 suggests questions of another sort. Banded March 13, he was taken on March 14, 18 (3 times), 19, 20 (twice), 21, 22, then April 5, 6, 8, and 10. Where was he on the thirteen days between March 22 and April 5? Was it merely a chance that he was not taken during all that time? Or did he leave the vicinity to feed elsewhere? If so, what sort of food attracted him? How far did he range? Many previous records at Thomasville, as well as some of my own, suggest that the birds concerned ranged over a comparatively small area. Mr. Baldwin's White-throated Sparrows, for example, apparently settled down for the winter in the vicinity of trap A. Traps B, C, D, and E were in different parts of the same weed-grown field, while A and AA, though not far away, were across a driveway in a large garden by the house. Now Chipping Sparrow No. 22785, for instance, was taken 36 times, always in one or another of the four traps mentioned, that is, in the same field of some three acres, never in either A or AA. Yet No. 22759 seems to have left that field. He was taken once under a net near A;

and as shown above, he disappeared entirely for thirteen days. Are some Chipping Sparrows more venturesome than others? At about the time when I missed No. 22759, I first noticed that many others were feeding in a similar, but much larger field, about a quarter of a mile away. Supposing someone had been operating one or more traps in that field; should we have found No. 22759 among the birds recorded there? What caused him to return to my traps April 5? And again, if I had been able to continue the work after April 10, how much longer should I have continued to take him? Did he nest in that field on Inwood Plantation? Or did he go on up through the coast states toward New England immediately after April 10? Or perhaps straight up north to Ohio? Will Mr. Baldwin take him at his farm near Cleveland this summer, or shall I find him on Lake Winnepesaukee? Are birds ever influenced to choose a nesting-site by food that they find at traps? Do the bread crumbs that we put out for them ever induce some to nest outside their ordinary range? And so on ad infinitum.

There are endless possibilities for speculation and study based on the statistics of the repeaters. Previous to April 1, 85 of the first 100 small birds banded (those requiring No. 1 bands), had repeated. After that time only 20 of these same 100 continued to visit the traps. Did those 100, roughly speaking, represent a wave of small birds, most of which had gone on by April 1? Perhaps there is no significance in these figures. But to me they suggest possible answers to various questions pertaining to migration. Note that I say they suggest; they do not prove anything, and cannot until many more people are trapping birds, in many localities.

Of the 356 birds handled, (new and "returns"), 245, or nearly 70 per cent, repeated, 171 of them more than once. That does not look as though they were frightened or injured by being trapped! These figures are even more significant when it is realized that the birds did not have equal opportunities for repeating; those banded during the last few days obviously had less chance than those taken during the first week, while the ones taken on the afternoon of April 10 had no opportunity at all.

I might go on indefinitely, pointing out interesting comparisons, statistics, and problems suggested by the records of repeating birds. But limits of space and time,—and perhaps of the reader's patience,—forbid further discussion along this line. But let no one think for a minute that "handling the same bird over and over again" becomes tiresome or is of no value.

Of the return records, by far the most interesting and most important is that of No. 19247, a Brown Thrasher banded by Mr. Baldwin at trap A, February 27, 1915, and taken again on March 13 of that same year. In 1916 he was taken three times, on March 4, 11, and 17, always in trap A; in 1917 three times, twice in A, March 11 and 13, once in AA, on the other side of the same house, on March 12. In 1918 and 1919 no trapping was done on the plantation, so that we have no way of knowing whether our Thrasher was there or not. But in 1920, he was there, being taken four times, February 16 and 20 and March 8 in AA, and March 11 in A. In 1921, although the traps were in operation, he was not taken, and it seemed reasonable to suppose that his history was completed. In 1920 he was at least six years old, since he was obviously at least one year old when banded; it would not have been unnatural if he had gone the way of all flesh in the meantime.

But this year he visited the traps more frequently than ever before. He was taken first March 28 at A, the same place where he had been feeding year after year. But his first appearance was later this year. Is he a migrant bird, and was he late in reaching the plantation? Or had he been there all the time, as a permanent resident, and was it a mere chance that I did not take him earlier? (Several times I had seen a bird with a band on his leg near the trap, but of course it was impossible to tell whether this was the famous No. 19247.) He had an automobile ride that day, to be photographed twice, held in the hand in the usual way, and suspended by the neck. (See Plate XVI.) In this latter position he was quiet, although ordinarily he was the most restless bird that I handled. I also removed his band, flattened it out, and had a picture taken of it. But alas! the thin metal had been bent once too often, and broke, as shown in the illustration;

a new band was thus necessary, and No. 19247 became No. 57742. To show that he was not discouraged, the Thrasher came back seven more times, March 31 and April 1 at AA, 2 at A, 3 at AA and A, 4 at A, and 8 at AA. This bird is now eight years old. How much longer will he continue to visit the traps at Thomasville?

Another returning Thrasher had to have a new band, No. 55227 became No. 57743. His old band was too small, and had pinched the leg. But note that while the leg was swollen, it was not, apparently, causing the bird any inconvenience or suffering. He was banded at C, March 26, 1921; I took him this year on March 27, at D, only a hundred yards or so away from the original place, and again on April 7 under the net in front of the house in which I was living, some two hundred yards from D.

White-throated Sparrows, which have figured prominently in Mr. Baldwin's records for Thomasville, had already become scarce when I began my work there; most of those that evidently spend the winter around the house had started on their journey north. Still I took three White-throats which had been banded in 1921, thus linking up this year's birds with those of every other year for which we have records.

In addition to the birds already mentioned the list of return records includes 29 Chipping Sparrows, 1 Blue Jay, 4 Cardinals, 1 Myrtle Warbler, and 3 more Brown Thrashers, making a total of 43.

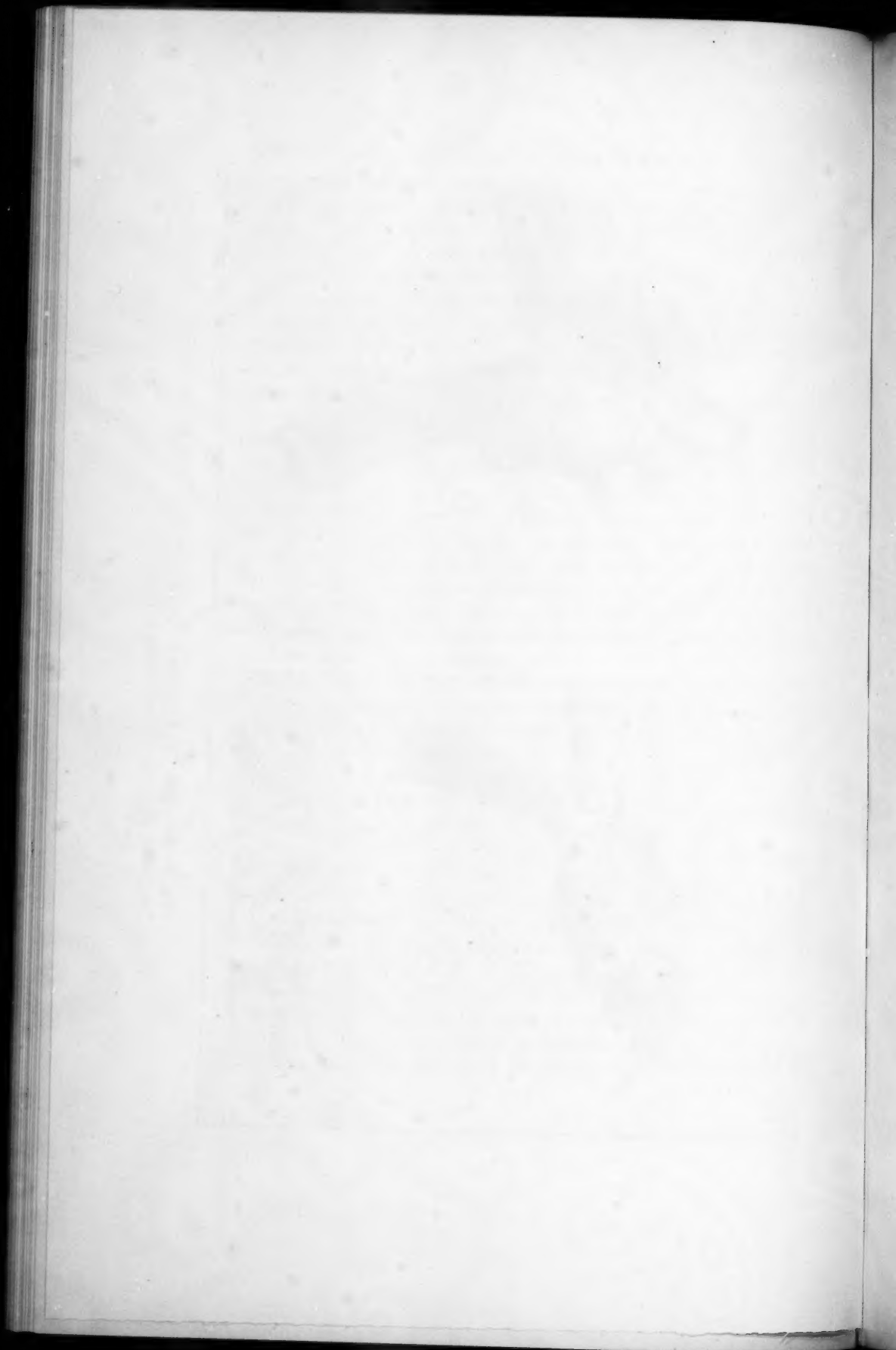
Thrasher No. 53085 is an interesting bird. He was banded February 19, 1920, at B; at some time previous to that date he had lost a foot; Mr. Baldwin made the following entry: "left leg off at mid-tarsus and well healed in a button." I took him March 22, 1922, at C in the same field as B, and again April 2 at A. His infirmity did not seem to trouble him in the least.

But this Thrasher was not the only bird with a deformity or injury. In fact, abnormal conditions were much more common than I had imagined.

A male Cardinal that I banded, No. 57732, was in much the same condition as the Thrasher. A female White-eyed Towhee, 55256, had no tail feathers, and was a funny-looking creature, literally "as big around as she was long." More than the usual percentage



1. THE FAMOUS BROWN THRASHER BANDED IN 1915 AND HIS BAND.
2. THE SAME BIRD IN A COMFORTABLE POSITION.



of Chipping Sparrows had diseased feet; 71 out of 287 (new and returns), or nearly twenty-five per cent. It is possible that being a beginner I noticed and recorded some very slight indications of disease that Mr. Baldwin, with his several years' experience, would not think worth recording; this would account in part for the great increase; (he has reported about ten per cent in past years). But on the other hand, it is certain that when handling a large number of birds within a short time, I failed to note many slight deformities, especially in the case of repeaters; and often a bird was in worse condition when he came back than when originally banded a week or more before. Hence it is likely that the disease is much more prevalent in some years than in others, as my figures seem to show.

This "toe disease" ranges all the way from a missing claw or two to an advanced stage in which the whole foot is badly swollen and bleeding. With as many birds to handle as I had at Thomasville, it is impossible to make a really satisfactory study of these symptoms; yet I was able to keep watch of some of the most notable cases, and to record changes from time to time. In some birds conditions became worse, and in some there was marked improvement. It should be carefully noted that these injuries are not in any way due to the trapping or banding of the birds. There is no relation whatsoever between them. They are caused by conditions over which man has no control; but for scientific trapping, we should never know anything about these diseases and abnormalities; through trapping and banding we may some time be able to prevent or lessen them.

A few comments must suffice as to the behavior of birds in the traps, in the gathering cage and in the hand, although to the operator this is one of the most fascinating of the many fields of observation opened by this work. Southerners that I met all cautioned me to be on my guard when handling Cardinals; "they are vicious birds," I was told, "and they'll give you a dig every chance they get." So I put on gloves the first two or three times I took these birds. Now they have very large, heavy beaks, and it is true that they will try to bite the operator's hand if possible. But it was difficult, if not impossible, to adjust a band with gloves;

I also discovered that while the Cardinal can take hold good and hard he cannot break the skin, and cannot cause any lasting soreness; in other words, the discomfort is so slight that no one but a mollycoddle need worry over it anyway. And I soon learned to hold the bird in such a way that he could not reach my finger with his beak. But almost invariably, after I freed the bird, he would stop just long enough to give me a "dig" before flying away. One beautiful male nipped me and then flew to the nearest tree and sang to me, as if to say that he regarded it all as a joke. It does not look as if he were frightened.

I found the Cardinal the easiest bird of all to drive into the gathering cage from the trap. In fact, "drive" is hardly the word to use in his case; usually Cardinals went into the cage at once, as soon as the doors were dropped. And there they remained until I could take them out; they did not run back into the trap, as other birds were apt to do. But the instant I started to reach into the cage, whether the bird saw my hand or not, (and usually his back was toward me, so that he could only "sense" the approaching fate), he began to squeal; and he continued to squeal, without any let-up, until freed. One Cardinal squealed so little, only six or seven times, as to cause special comment in the records.

White-throated Sparrows frequently tried to bite; and for a small bird, the White-throat is quite a scrapper. But of course he is too small to hurt one. The Thrashers are well named. They invariably thrashed around the trap, and usually after going into the cage they thrashed out again so quickly that I wondered how in the world they could turn around with such lightning-like speed. But once in the hand, the Thrasher was easy to handle and as gentle as the proverbial lamb.

Strange as it may seem, the Blue Jay impressed me as about the gentlest bird of all. When one stopped in the middle of a house trap, looked straight up into my face, and said, "yarrup," I was quite ready to forgive him all his sins. All the Jays that I took were very easy to handle. Only once did one nip me. To be sure, their claws did sometimes hurt a little as the birds closed them around my finger in perching there, but we can hardly blame them

for that; no doubt their claws were meant to be sharp. The Jays even submitted without protest to the various measurements that were necessary to determine whether they were Blue Jays or Florida Blue Jays.

Of the Chipping Sparrows, very few struggled or were at all restless. Some squealed, some were perfectly quiet. Nearly all seemed to want to "cuddle." Some went readily into the gathering cage, more went only after considerable urging, while in a few cases it was impossible to drive the bird at all, and it was necessary to put my hand cautiously into the trap and take him out. I am bound to say that my experience with Chipping Sparrows has not increased my respect for their intelligence! No. 22735 never learned, with all his forty-five visits, to go through the door when it was open in front of him; he always wandered back and forth, not realizing that there could be more than one side to the compartment, until I am afraid that sometimes my language was not very polite! Of course I talked to the bird; that goes without saying. But then, I do not believe he cared!

My reference to the two kinds of Blue Jays illustrates one group of questions that may be answered through trapping. It happened that I banded four of each kind; but that does not prove that the two are represented in equal numbers at Thomasville or in Georgia at this season. But this is only one of a number of similar problems that bird-banding may be able to solve. Are all the Chickadees in that region Carolina Chickadees, or do the Black-capped Chickadees, the species so common in the north, ever venture so far south? Are there Downy Woodpeckers, as well as Southern Downy, and Hairy, as well as Southern Hairy Woodpeckers present in the winter?

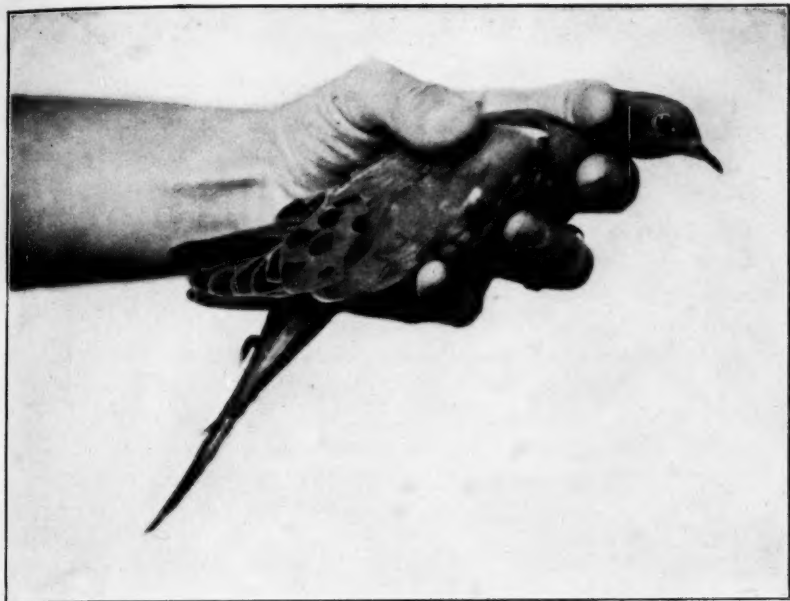
How shall we answer these questions to a certainty? How shall we trap birds of quite different habits, with which little or nothing has yet been done,—Warblers, Vireos, Flycatchers, Kinglets, Nuthatches? There is need both of traps suitable for these and other kinds of birds, and of bait that will tempt them. For as already pointed out, the work described in this article has been mostly with seed-eaters; both experience and common-sense tell us that we can hardly expect to take in the same way many of the little insectivorous birds that flit about the tree-tops.

Perhaps it will be well to describe briefly the equipment used and the locations of the traps, although it has been assumed throughout that the reader is already familiar with articles published previously by Mr. Baldwin, and with directions for trapping distributed by the U. S. Biological Survey.

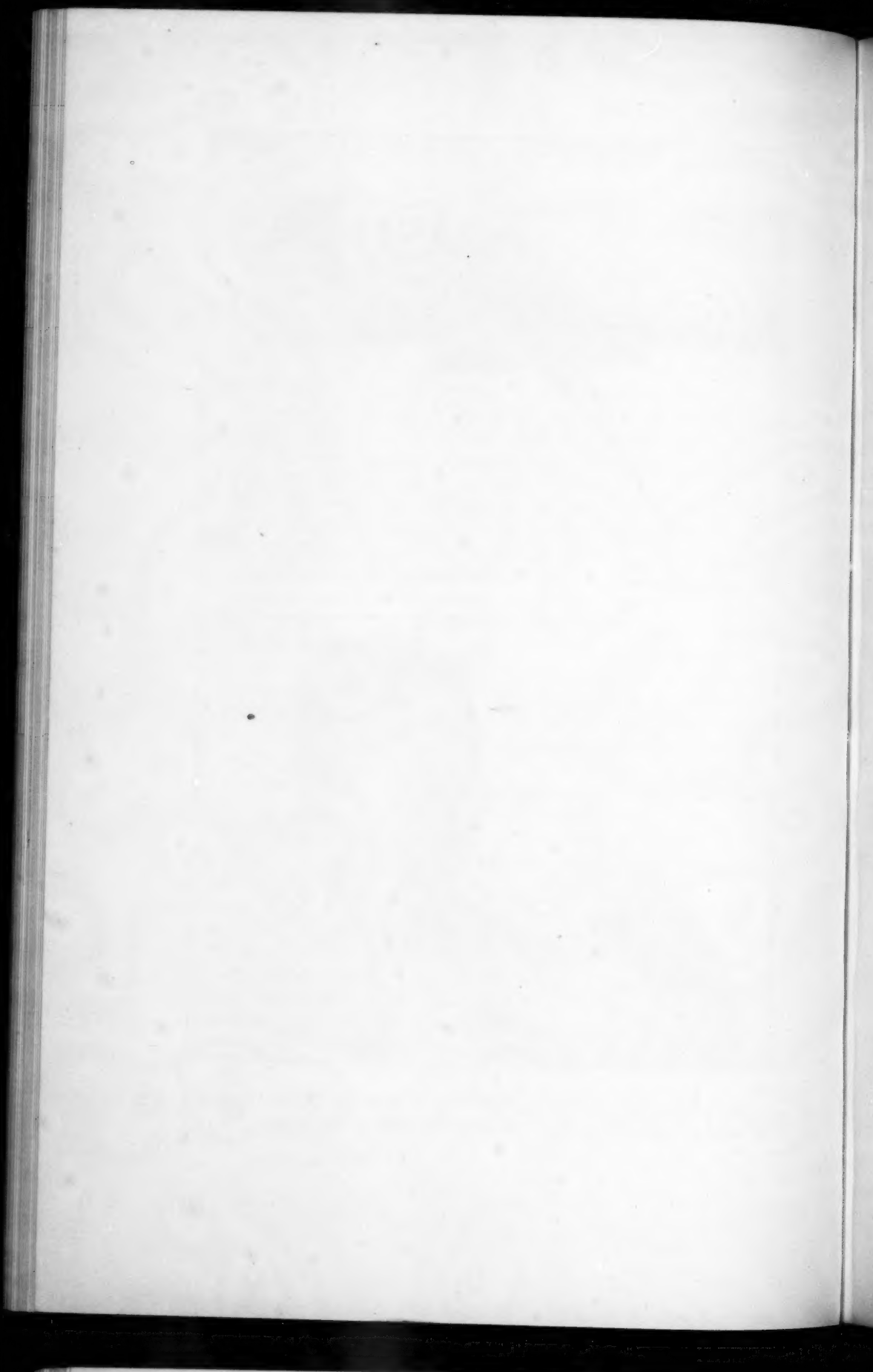
For bait, I used the best quality of chick feed and bread crumbs. I found slightly stale bread easier to crumble, and quite as acceptable to the birds as fresh bread; the latter is apt to become soggy or "doughy."

I had four Government sparrow traps, all in a weed-grown field; three of them were at intervals of a hundred yards in a straight line from south to north, the fourth at about the same distance from this line, across the field to the east, and beside an old well overgrown with honeysuckle vines, an admirable place for birds. In addition, I used two house traps, similar to the one described in Circular 170 of the Biological Survey, only mine were two feet high instead of five. My experience with these led me to believe that the door which is left ajar to permit the birds to enter should be wide enough to admit the operator as well; for with a trap as large as this it is sometimes desirable to go in, as a bird that has gone into the box frequently comes back into the trap before the operator can get around to close the door and take the bird. Naturally, with a trap two feet high, it would be necessary to go in on hands and knees; but in this work one should expect to wear clothes that cannot be damaged by such a trifle. Possibly, however, some arrangement can be devised with a door swinging into the trap and up, that will obviate this necessity. Any door sliding up and down in a groove should be provided with a peg, to prevent it from slipping and injuring the birds.

Finally, I had two net frames, and while these did not take many birds, they did furnish considerable fun; for it was with one of these that I trapped while I ate, as previously stated. When the weather permitted, and it usually did, I took my meals on the front piazza. Now about thirty feet in front of this piazza was one of the net frames, a square frame with a net over the top and a small swing door through which to drive the birds into the



1. MOURNING DOVE. THE FIRST ONE BANDED AT THOMASVILLE.
2. BIRDS ALMOST ALWAYS LOOK ONE STRAIGHT IN THE EYE.



box; a short stick held one side up away from the ground, while a string attached to the stick permitted the operator to let down the frame when he observed a bird safely feeding under the net. Of course this arrangement has its limitations. In order to capture a bird, the operator must be on the spot at the psychological moment. But that was precisely the situation; with the string leading to my dining-table on the piazza, the psychological moment sometimes coincided with the gastronomical moment; and then a slight tug, and I put down fork or spoon and attended to the captive bird. On one such occasion I "netted" eight Chipping Sparrows at one fell swoop!

In conclusion, let me give a summary in tabular form, of the results of my work at Thomasville this year. In thirty days I banded a total of 313 individual birds, as follows:

258 Chipping Sparrows	2 Field Sparrows
12 Cardinals	2 Towhees
7 White-throated Sparrows	2 Red-bellied Woodpeckers
5 Juncos	1 Mourning Dove
5 White-eyed Towhees	1 Hermit Thrush
4 Blue Jays	1 Myrtle Warbler
4 Florida Blue Jays	1 Palm Warbler
4 Brown Thrashers	1 Song Sparrow

I took forty-three birds previously banded, ("returns"), as follows:

29 Chipping Sparrows	3 White-throated Sparrows
5 Brown Thrashers	1 Blue Jay
4 Cardinals	1 Myrtle Warbler

These 356 birds repeated in the aggregate 1448 times, making a grand total of 1804 birds handled.

The possibilities of this work are limitless. It is by far the most fascinating sort of bird-study imaginable. The contributions it can make to the scientific knowledge of birds are of inestimable value. The work is within the reach of all, or at least of all who have a suitable location for a trap; it involves but little expense, and requires no great experience and little ornithological knowledge.

The results will increase in geometrical progression as the number of bird-banders increases. And we may confidently expect that more and more people will actively take up the work as its possibilities become better understood.

509 Audubon Road, Boston, Massachusetts.

BIRD NOTES FROM NORTH GREENLAND.

BY LANGDON GIBSON.

UNAVOIDABLE circumstances have until now prevented the putting in shape of my notes, on birds, observed during the first Peary Expedition of 1891-92, of which I was the ornithologist. The fact is, immediately upon my return from Greenland, I married, and, putting aside all thoughts of exploration, became associated with the General Electric Company, of Boston, afterwards moving to Schenectady, N. Y. The company at this time was growing with leaps and bounds, and what little time I had at my disposal was spent in outdoor sports; and now after thirty years, having been sent south for my health, with strict injunctions to give no thought to business, what greater pleasure could come to me, living, as I am, in a little shack on a Florida Key, than to bring out my Arctic Journal, and review my bird notes¹ for publication in 'The Auk'?

On the sixth of June, 1891, we sailed from the foot of Baltic St., Brooklyn, N. Y., bound for North Greenland on the Barkentine-rigged Steam Sealer, "Kite." As we steamed through Long Island Sound, enthusiasm ran high in anticipation of the adventures which were to be ours during the ensuing year; and after the usual vicissitudes attending ice navigation, early in August, we established

¹ A report on this collection by Witmer Stone will be found in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1895 pp. 502-505. Dr. Stone withheld this report for some time in the hope that I would be able to get my field notes in shape to accompany it, but was finally forced to publish it alone. A report on the collection made by Dr. Wm. E. Hughes, ornithologist of the West Greenland Expedition, which accompanied the Peary party to their headquarters in 1891, was published by Dr. Stone in the Proceedings of the Academy for 1892, pp. 145-152. Both of the collections are in the Academy Museum.

winter quarters in Greenland two and one third miles from Cape Cleveland, on the southern shore of McCormick Bay, in latitude 77 degrees and 40 minutes North, and longitude 70 degrees and 40 minutes West.

Our house was placed about thirty feet from the beach, and about ten feet above sea level; the surrounding country was not particularly fertile, but here and there among broken rocks grew a liberal sprinkling of long grass and the omnipresent Arctic Saxifrage, with its pretty little purple flower. Immediately back of our house were some brown trap rocks presenting a front two or three hundred feet high, where a pair of Northern Ravens had nested. Back of these rose the iron-stained cliffs, from which, most appropriately, our house was named, by Commander Peary, "Red Cliff House."

McCormick Bay cuts a wedge-shaped gash seventeen miles deep into the rugged coast of North Greenland, and is almost entirely bounded by cliffs of igneous rock, ranging from one thousand to eighteen hundred feet in elevation, with here and there a valley of rather steep ascent, offering access to the inland ice or "Mer de glace" above and beyond.

During the short summer, flowers bloomed in abundance along the grassy slopes at sea level, while at the head of our bay, lay a fertile valley abounding in Reindeer (Tucktoo, as the Eskimo call them), Blue Foxes, and Arctic Hares. In the center of this valley, a fresh water lake, four or five miles in length, extended back to the great shadowy cliffs, which held the "Mer de glace" in check. At the north-east corner of the bay, the Sun Glacier calved its inexhaustible supply of bergs into our waters, and in the summer months, great Cathedral-like paleocristic masses of ice bound south, drifted lazily on their way to plough furrows in the Tosca Banks; while a little farther to the westward lay the Five Glacier Valley, perhaps the most salubrious and fertile of them all, and where we did most of our hunting. The entrances to our bay were guarded on either side by two imposing capes: Cape Cleveland, a typical bastian headland at the south, while six or eight miles to the north rose Cape Robertson. Fifteen miles to the westward in Whale Sound, three rugged islands stood like sentinels, Herbert,

Northumberland, and Hakluyt; their bold outlines often appearing distorted by mirage. It was amid such surroundings that I made the following observations.

1. **Gavia stellata.** RED-THROATED LOON. Eskimo, *Kark-sough*.—A common summer resident. Last seen on September 19, 1891, and the first observed at Cape Cleveland June 8, 1892; soon became common, and by June 20, had begun mating. Almost every fresh water lake and pond, in the valleys at the head of the bay, contained a pair of these birds. They were exceedingly shy, and always preferred flying to diving, as a means of retreat, whereas when chased in the open sea, they would invariably seek safety by diving.

On July 9, I procured two fresh eggs from a nest in Tucktoo Valley. The nest was placed upon a small tussock some three feet in diameter, lying about midway between the shores of a small pond. It was a rude affair and concealed by a luxuriant growth of long rank grass, and was composed of a matted mass of wet weeds. In attempting to reach it, I was compelled to proceed with great care, owing to the fact that the bottom of the pond was exceedingly slippery, caused by a coating of ice still adhering to it. These small ponds freeze solid in the winter, and the ice melts from the top down. As might be expected, the entire congealing of the water of these ponds in winter, means that there is no food supply to be found there. The result is that parent birds make excursions to the open seas, where, after satisfying their own appetites, they bring small fish to their offspring. A young bird collected in a pond at Herbert Island had its crop well filled with small salt water fish.

Specimen taken in Five Glacier Valley July 10, 1892. Length 25.25 in. Ex. 42.75 in.

2. **Fratercula arctica arctica.** PUFFIN. Eskimo, *Kill-ing-gah*.—While at Hakluyt Island on August 18, 1891, one pair of these birds were seen inhabiting the same cliffs upon which the Brünnich's Guillemots bred in countless numbers. This was the only pair observed during our stay in North Greenland. They undoubtedly bred in the cliffs, as after each gun discharge, when thousands of Guillemots were leaving their nests in great clouds, the pair of Puffins would leave the cliff and shortly return to the same niche, which was at least one hundred feet above the sea level.

3. **Cepphus mandti.** MANDT'S GUILLEMOT. Eskimo, *Soh-gwah*.—A summer resident. Common at Cape Cleveland, where probably upwards of twenty pairs bred. The nests were generally placed about thirty or forty feet above the sea, in the very inaccessible niches of the cliff. Another small colony of these birds, was noticed in Hakluyt Island, in the low regions of cliffs adjoining the loomery of *Uria lomvia*.

4. **Uria lomvia lomvia.** BRÜNNICH'S MURRE. Eskimo, *So-gwah*.

Next to the Little Auk these birds outnumbered any other species seen by us, but as they bred in colonies they were not very widely distributed. A vast number of these birds inhabited the steep perpendicular cliffs which formed the northern boundary of Hakluyt Island. We visited this loomery on August 16, 1891, and while some distance off, observed scattering birds flying from the island to their feeding grounds, and back, each of those flying toward the island carrying in its mouth a small fish for the nestlings, that by this time, had no doubt made their appearance.

As we approached the focus of their activities, they appeared in greater numbers, and upon finally reaching the cliffs the scene was truly bewildering. A heavy surf was breaking upon the perpendicular cliffs and above the roar of the breakers was heard the discordant cries of thousands upon thousands of these birds that left the cliffs in mighty whirring clouds at each gun report.

We were compelled to exercise extreme caution in picking up dead birds, keeping our whale-boat stern on shore, and when a dead bird was picked up, vigorous strokes were generally required to prevent piling up on the rocks.

They were first seen in open water at Cape Cleveland, June 6, 1892; and a female taken here on June 18 had a perfectly formed egg in her body, ready to deposit. Their flesh was most palatable, and not in the least fishy, as might have been expected.

5. **Alle alle.** DOVEKIE. Eskimo, *Ak-pal-i-ark-so-wah*.—This little bird is a staple stock commodity in nature's great department store and plays an important part in the domestic economy of the North Greenland Eskimo. It is a summer resident, breeding in immense colonies, and wherever a convenient talus of broken rock presents itself, there you will look for their nests. The largest loomery near Red Cliff House, was in Robertson Bay, next to, and north of McCormick Bay, while other large loomerics exist on the southern shores of Northumberland and Hakluyt Islands. They were first seen in the open water at Cape Cleveland June, 8, 1892. Eggs were brought to me by natives from Robertson Bay on June 30, but incubation was already so far advanced as to make it difficult to preserve them.

The Little Auk, like the Snow Bunting, seeks shelter for its nests beneath rocks. They lay but one pale blue egg about the size and shape of a Quail's egg.

In the morning hours during breeding season, countless thousands of these birds were to be seen, in flocks ranging from fifty to five hundred, flying to and from their nesting sites, to the feeding grounds or open water, which at that time lay well out in Whale Sound, where a small shrimp—their principal food—was most plentiful. The Little Auk, due to its habit of depositing its egg early in summer, before the ice has passed out of the bays, is compelled to travel long distances to open water for its

food; and in consequence nature has provided small pouches or receptacles in the bird's throat, which they fill with from four to six shrimp, after supplying their own requirements. These are carried back to the hungry nestlings. Here we have a possible explanation for only one egg to the nest as the question of food supply for a larger family would become a serious problem.

The Little Auk, although a strong and swift flier, accomplishes its long flights by an apparently heavy expenditure of energy. Their wings are short and remarkably small in proportion to the bulk of the bird; and they drive themselves through the air at great speed by rapid vibrations of the wing, making a high pitched, whirring noise, which is so multiplied in a large flock, as to make it possible to hear them, especially when they are flying high before, or at least quite as soon as, they become visible to the eye. They fly in flocks at different levels, from ten to one thousand feet, and occasionally a flock drops several hundred feet to sea level, with a tremendous rush of wings and again occasionally dives, from elevations of one hundred feet, or less, into the water.

I have seen the surface of McCormick Bay, for miles in extent, covered with a pinkish scum, the droppings of these birds. When the flight was on, they passed in such numbers over our house, that we found it necessary to take in the bedding that had been put outside to air. Some of the naturalists in returning on the "Kite," preserved with great care, in small bottles, specimens of snow discoloured by the droppings of the Little Auk, believing at that time that they were securing samples of the "*protococcus nivalis*"—the name assigned to the microscopical plant which, if it exists at all, is at least not fairly entitled to the credit for all of the red snow found within the Arctic Circle.

During the breeding season, the Little Auk is netted in great numbers by the Eskimo at their nesting sites. The skin is removed by turning it inside out through the neck, by means of stretching; an operation requiring much skill, and at which the Arctic Highlanders are adepts. The bodies are eagerly devoured by the natives, while the skins, after being properly dried, and afterwards chewed, or rather mouthed into pliability by the women, are made into garments or shirts, which are worn with feathers next the body under the seal skin "netcher." Approximately two hundred and fifty such garments are needed each year to supply the Arctic Highlanders and as it requires at least fifty skins to make a shirt, it will be seen that twelve thousand five hundred birds are used annually for this purpose alone, while no doubt many times this number are taken each year for food.

The Blue Fox also levies toll, for on the highest part of Hakluyt Island on August 18, 1891, we found a cache of twenty or more Little Auks, the winter's supply of a provident fox.

In spite of the heavy demands made upon this chunky little bird, I

am forced to the conclusion, judging from personal observation, that the total number destroyed each year forms but a negligible percentage of the vast horde of this bird which literally swarms in north Greenland.

6. *Stercorarius parasiticus*. PARASITIC JAEGER.—Eskimo, *Ish-ingwah*. This trim highwayman was common in our bay, but I could obtain no satisfactory statements from the Eskimo as to its nesting habits.

One day a female Eider appeared flying low in great distress, closely pursued by a Jaeger. The duck was evidently fatigued, for when it got near me it began tactics of zigzagging. The Jaeger did not actually strike at the duck, but kept aggravatingly close. The duck finally alighted, the Jaeger doing likewise within a few feet, and after considerable bobbing up and down the Eider succeeded in regurgitating; after which it waddled away a few feet, shook itself, gave its tail a wag or two, and with a quack took to wing again, while the unruffled Jaeger, apparently fully satisfied with the results obtained, walked over to the pile of semi-digested food, and proceeded to dine.

First observed at Red Cliff House June 12, 1892. The following measurements were obtained:

Red Cliff House, July 13, 1892. Male. L. 18.25 in. Ex. 41 in.

Red Cliff House, July 13, 1892. (undetermined) L. 19.50 in. Ex. 41.37 in.

Tucktoo Valley, July 23, 1892. Male L. 20.50 in. Ex. 43.37 in. Tail 8.12 in.

7. *Stercorarius longicaudus*. LONG-TAILED JAEGER. Eskimo, same as Parasitic Jaeger.—Birds of this species were taken as follows:

Tucktoo Valley, July 15, 1892. Male, L. 21 in. Ex. 36.50 in. Tail 11 in.

Tucktoo Valley July 22, 1892. Male, L. 22.25 in. Ex. 38 in. Tail 12 in.

8. *Pagophila alba*. IVORY GULL. Eskimo, *Noy-erue-Ah-ho*.—Not common at Red Cliff, preferring the more open waters of Inglefield Gulf. A specimen was brought in by one of our natives, having been snared by means of a seal skin noose ingeniously placed near the carcass of a seal which had been butchered on the sea ice about six miles off shore.

In July, 1891, while on a voyage north in Melville Bay, a Polar Bear was observed approaching the ship. The bear was being badgered by three of these birds, which kept making successive swoops at him, and so closely did they approach that the bear would snap at them quite dog like and taking a few jumps in their direction, with grace and surprising agility, would rear to his full height, and standing erect, cuff at his tormentors with his mighty fore arm—a blow that the gulls were careful to avoid.

An immature male and female were taken in Melville Bay by Dr. Wm. E. Hughes on July 5 and 6, their wings and breasts showing blackish markings.

A specimen was taken in McCormick Bay on July 17, 1892.

9. *Rissa tridactyla tridactyla*. KITTIWAKE. Eskimo, *Tata-rah*.—A summer resident. A few pairs bred in the bird cliffs at Hakluyt Island. Their nests were bulky affairs placed well above the sea, and seemed from the best views we could obtain, to be composed mostly of dry sea weed and mosses. Like *Pagophila alba* these birds also seemed to prefer the open sea for their hunting. They appeared at Red Cliff House July 24, and were plentiful until our departure for home about the middle of August, 1892.

10. *Larus hyperboreus*. GLAUCOUS GULL. Eskimo, *Noy-ah*.—Along the southern shores of Northumberland and Herbert Islands, five hundred feet or more above the sea level, these birds bred in large numbers. In August, 1891, I cruised along close to the shores of these islands in an open whale boat and found the beach lined for miles with the young birds in gray plumage. A Blue Fox, stopping occasionally to bark at us, was trying its best to stalk them. After repeated failures, which always ended by the particular bird selected flying away to safety and with it all the other birds in the immediate vicinity, the fox lost self control and would sit on its haunches with head thrown back and cry as though its heart would break.

At the head of Five Glacier Valley, on Friday, August 19, 1892, while hunting for a lost companion, — who was never found, I witnessed a remarkable performance. I quote from my journal:

"I passed several lakes and came to the end of the valley and what an impressive sight. It ended abruptly against the perpendicular wall of a great glacier. I saw no signs of the balance of the party who were hunting in my direction, via Robertson Bay, and decided to wait for them at this point. It was beginning to snow, and above me I could hear the harsh cries of the Little Auks, as they returned in flocks from the feeding grounds, and occasionally the hollow scream of the Glaucous Gull. Every now and then the old glacier would send off a report like muffled thunder, as some new crack appeared on its mighty surface. Suddenly a young Little Auk, (its first flight no doubt) appeared directly above us, its body almost perpendicular, wings beating the air vigorously. Its flight was feeble and no match for a giant Glaucous Gull coming behind, which seized the Little Auk in its mouth and gulped it down whole without altering its course."

When returning from the inland ice on June 2 and still out of sight of land, when almost abreast of the Humboldt Glacier, at an elevation of perhaps three thousand feet, I observed a flock of eight of these Gulls flying far above our heads, travelling in a northerly direction. On June 10 they had appeared in large numbers. The stomachs of a number of them that we examined, contained clam shells and whelk eggs. The young ones, which were much less shy than the parents, were seen flying about during the early part of August. Last seen October 13, 1891.

Serawny young birds not quite ready to fly are killed in considerable numbers by the Eskimo, who devour them raw and undrawn with great relish.

Specimens taken as follows:

Red Cliff House, Male, L. 25.25 in. Ex. 59.75 in.

Tucktoo Valley, June 1892, Male, L. 29.50 in., Ex. 65.25 in.

11. *Sterna paradisaea*. ARCTIC TERN. Eskimo, *Imer-ko-talia*.—Probably bred on shores of our bay; first seen in Five Glacier Valley, June 16, 1892, and continued common throughout the summer. This was the only bird observed that could put the Jaegers to flight. On June 18, in this same valley I saw a Jaeger chasing one of these Terns. The latter was quickly joined by five of its companions with the result that the tables were quickly turned, and the Jaeger was glad to call off the hunt.

Specimen taken as follows:

Five Glacier Valley, August 12, 1892. Male.

12. *Fulmarus glacialis glacialis*. FULMAR. Eskimo, *Karle-out-luk*. Whalers, *Nann, Molly*.—Seldom strayed into McCormick Bay. One observed in August 1891, near Hakluyt Island, and again a single bird seen on July 28, a few miles from Cape Cleveland. The natives knew nothing of their nesting habits. On the voyage north they followed the ship, much after the fashion of gulls, until we were well into the ice of Melville Bay.

13. *Clangula hyemalis*. OLDSQUAW. Eskimo, *Argly*.—Bred in numbers at the head of McCormick Bay. Although, in spite of persistent search, I was unable to locate a single nest, I found in the body of a female killed at the head of our bay on June 22, 1892, a perfectly formed egg with a hard shell. These birds first appeared in the open waters at Cape Cleveland on June 6, 1892. Their principal food consists of shrimps and small mollusks.

We found the flesh of these birds palatable, and entirely free from any flavour of fish, quite different from the birds taken in Long Island Sound. No doubt this absence of fish flavour was due to change of diet.

Specimens taken as follows:

Five Glacier Valley, June 16, 1892, Male L. 22.50 in. Ex. 30 in.

Tucktoo Valley, June 21, 1892 Male, L. 21.62 in. Ex. 28.50 in.

Tucktoo Valley, June 22, 1892, Female, L. 15.25 in. Ex. 26.50 in.

14. *Histrionicus histrionicus*. HARLEQUIN DUCK.—A flock of about twenty males seen in Robertson Bay early in August, 1892. They were exceedingly shy, and on approach, took to wing. Quite likely the Harlequins separate by sexes prior to migration as do the Eiders. The presence of these birds in Robertson Bay, gives credence to the belief that they breed as far North as 78 degrees North Latitude.

Camptorhynchus labradorius. LABRADOR DUCK. Eskimo, unknown.—Hoping to add to the world's knowledge of this species, I went north armed with pictures of this duck, given me by my very dear friend, the

late Wm. Dutcher. The information obtained by me was negative, and here follows my report to Mr. Dutcher, which was printed in the 'Auk,' Vol. XI, No. 1, January, 1894.

Friday, June 12, 1891, we reached Sidney, Cape Breton, but made no inquiries, as we saw no one who would be likely to know anything about the species.

Monday, June 15, while passing through the Straits of Belle Isle we stopped long enough to catch some codfish. Here we were boarded by some French Canadians. I showed each one of them the plates of the Labrador; they had never seen such birds.

Saturday, June, 27, we reached the settlement of Godhavn, Disco Island, Greenland. Here careful inquiries were made among perhaps a dozen hunters of the tribe. They also, through an interpreter (a Dane), said they never had seen the bird.

Leaving Disco we proceeded by slow stages, owing to heavy ice in Melville Bay, to our final camping grounds on McCormick Bay. During the ensuing winter every male Eskimo in the tribe came to visit us, and so, from time to time, I questioned nearly every one of them on this subject, showing each my picture of the duck. On first seeing the picture, with few exceptions, each native exclaimed that they had "Tarkkooed-emis-uh," meaning by this that they had "seen many." They gave the duck the name "Argly," and told me in the spring I could get many, also their eggs, at the head of our own bay. I was disappointed, when spring came, to have my Labrador Duck materialize in the form of the Long-tailed Duck, which, sure enough, was very plentiful in the head of the bay.

In August, 1892—the latter part I believe—on our way home we touched at Godthaab, the largest town in Greenland. Here we were entertained by Herr Anderson, the Danish inspector of South Greenland, an accomplished naturalist, and at his house I had the pleasure of inspecting one of the finest collections of arctic birds I have ever seen. I showed him my little pamphlet on the Labrador Duck, and also presented it to him on my departure. He told me that his collection represented twenty years' work, and all the hunters in South Greenland (some five hundred men), had instructions to bring to him any strange birds that they might get. In this way, he added to his collection from time to time many rare birds and eggs. In all this time he claims to have heard nothing of the Labrador Duck, which I consider is substantial proof that within the last twenty years the Labrador Duck has not visited Greenland. From Godthaab we came directly home to Philadelphia, and this ended my ineffectual attempts at learning something more definite regarding this species.

15. *Somateria mollissima borealis*. NORTHERN EIDER. Eskimo, *Metek*.—Found breeding in immense numbers on the Duck Islands, three low lying islands in Melville Bay where the "Kite" touched on the voyage north. Probably, upwards of ten thousand pairs bred in this

sanctuary, free from the ravages of the Blue Fox. The males were still with the females and usually stood sentinel near the nest, while the female covered the eggs.

Egg laying must begin at about the same time, in these large nesting communities, for of the five hundred nests found all eggs examined were in a uniform advanced state of incubation and about ready to hatch, while not a single young bird was to be seen on, or in, the waters surrounding the island. The majority of nests found contained four eggs, other nests had only three, and but three of the nests held six. Two undersized, infertile eggs were collected.

The nests were exceedingly dirty, and although well supplied with down, could almost be picked up "enbloc." Eider down no doubt has to undergo many cleansings before it becomes fit for the market.

The Eiders were summer residents at Red Cliff and bred in our bay but in no such quantities as on the Duck Islands.

First appeared at Cape Cleveland on June 6, 1892, where a set of five fresh eggs was taken on June 20, one of the eggs having a soft shell. By July 26, when hatching was completed, males began gathering in large flocks, and by August 5, had disappeared, leaving the females to guide the young ones south.

Cape Cleveland, June 27, 1892, Male L. 22.50 in. Ex. 39 in.

Red Cliff House, July 3, 1892, Female L. 21 in. Ex. 35.25 in.

16. *Somateria spectabilis*. KING EIDER. Eskimo, *Metek-we-aho*.—The elegance and good taste displayed, in fact lavished, on the male of this species fascinated me.

On June 21, 1892, a female was taken in Tucktoo Valley with ovaries much enlarged, and on July 9 I collected in this same valley two sets of fresh eggs, three and four, respectively. The nests, well lined with down, were small and well concealed in tussocks of grass, lying midway between the shores, or small ponds well out of the way of any predatory fox and at each nest the male stood watch while the female kept the eggs warm.

The fatness of these birds was remarkable; their intestines were embedded in a solid lump of fat from which dripped, upon being squeezed in the hands, a clear, colourless and odorless oil.

The following measurements were obtained:

Tucktoo Valley, June 21, Male L. 23 in. Ex. 36.37 in.

Tucktoo Valley, June 21, Female L. 21 in. Ex. 37.37 in.

Tucktoo Valley, June 22, Male L. 22.25 in. Ex. 38 in.

Tucktoo Valley, June 23, Male L. 22.50 in. Ex. 38 in.

Tucktoo Valley, June 22, Male L. 22.25 in. Ex. 37.50 in.

Tucktoo Valley, July 15, Female L. 21 in. Ex. 37 in.

17. *Chen hyperboreus nivalis*. GREATER SNOW GOOSE. Eskimo, *Kang-ou*.—It was my good fortune to record, for the first time, the breeding of this species in North Greenland.

A family was found in Five Glacier Valley on July 11, 1892. The male disputed my advance with head lowered and much hissing, quite after the fashion of the barn-yard goose, and before I was aware of the existence of goslings I shot the female. Then I took two of the goslings, that were about two weeks old, leaving the gander to rear the remaining six.

The birds were on the nest at the time of capture. The nest itself was well lined with grasses, and placed near a pile of broken stone, beside a marshy spot some acres in extent and about one hundred yards from a shallow pond.

On August 21, when again passing through the valley, I was happy to see the male proudly marching at the head of his family of six at least ten miles from the nest. As he had a broken wing, and his family then had every indication of being able to shift for themselves, I reluctantly, and in the interest of science, dispatched him.

The following measurements were taken:

Five Glacier Valley, July 11, Female, L. 30.50 in. Ex. 59.50 in.

Five Glacier Valley, Aug. 21, Male, L. 28 in. Ex. 50.50 in.

18. *Branta bernicla glaucogastra*. BRANT?—On June 6, a flock presumably of these birds, was observed flying high in a northerly direction.

19. *Canutus canutus*. KNOR. Eskimo, *Ting-ma-tear*.—First seen in Tucktoo Valley, June 11, 1892, appearing in small flocks of from ten to twenty birds. A week later they were to be seen in pairs and it was then I searched faithfully for a nest, without success.

On July 11, however, while walking along a sandy stretch of ground, sparsely covered with vegetation and not over one hundred yards from the shore of McCormick Bay, in Tucktoo Valley, I flushed an anxious female. Half an hour's search was finally rewarded by finding two young birds in the down. They were closely huddled together, facing in opposite directions, and made no attempt to escape. The birds were so small, that, even though there was no sign of a nest, I looked carefully but unsuccessfully for traces of egg shells.

Measurements taken as follows:

Tucktoo Valley, June 22, Male, L. 10 in. Ex. 19.50 in.

Tucktoo Valley, June 22, Male, L. 10.62 in. Ex. 21 in.

Tucktoo Valley, July, 10, Immature, L. 7.25 in. Ex. 13 in.

Tucktoo Valley, July 11, Female, L. 10 in. Ex. 19 in.

20. *Arquatella maritima maritima*. PURPLE SANDPIPER.—Although none of these birds were seen in our neighborhood Dr. Wm. E. Hughes collected on the Duck Islands, in Melville Bay, on July 22, 1891, a nest containing two fresh eggs. The female was also taken.

21. *Crocethia alba*. SANDERLING. Eskimo, *Ting-ma-tear*.—A summer resident, common, and breeding in considerable numbers, both in the Five Glacier and Tucktoo Valleys.

On July 11, I caught two very young birds in down. In spite of their

tender age, they were strong runners and while holding them the parent birds, trailing one wing on the ground, ran hither and thither within five or six feet of me, thus making the identification sure. The fact of finding but two young ones, and of finding but two young Knots, leads me to suspect that these birds lay but two eggs. Their natural enemies, however, such as the Blue Fox, the Parasitic Jaeger, and Glaucous Gull, which abound in these valleys, might readily account for the disappearance of a stray chick or two.

In the stomach of the male taken in Five Glacier Valley I found six large grubs each about one inch long.

Measurements taken as follows:

Five Glacier Valley, June 14, Male L. 7.50 in. Ex. 15 in.

Five Glacier Valley, Aug. 12, Female L. 7.87 in. Ex. 14.75 in.

Five Glacier Valley Aug. 12, Male L. 7.50 in. Ex. 14 in.

22. *Charadrius hiaticula*. RINGED PLOVER. Eskimo, *Ting-ma-tear*.—In the late fall of 1891, at the head of our bay, I rescued one of these birds that had become imprisoned in a thin skim of ice. Its eyes were closed, and it seemed fully resigned to the fate that awaited it, had I not happened along.

First made its appearance at the head of our bay June 5, 1892, and probably bred there.

Measurements taken as follows:

Five Glacier Valley, June 16, Male L. 7 in. Ex. 15.25 in.

Five Glacier Valley, June 22, Male L. 7.50 in. Ex. 15.25 in.

23. *Arenaria interpres interpres*. TURNSTONE. Eskimo, *Ting-ma-tear*.—These birds were first seen in Tucktoo Valley June 21, and again on July 15. Although no nests were found, they undoubtedly bred in our neighborhood. By the middle of August they were assembling in large flocks in company with the Sanderling and were last seen August 18.

Stomachs examined contained insects' legs.

The following measurements were taken:

Tucktoo Valley, June 21, Male L. 9.25 in. Ex. 18.37 in.

Tucktoo Valley, July 15, Female L. 9.50 in. Ex. 18.75 in.

Five Glacier Valley, August. 13, Female L. 8.87 in. Ex. 18.87 in.

24. *Lagopus rupestris reinhardtii*. REINHARDT'S PTARMIGAN.—A female taken on the shores of Inglefield Gulf near Cape Cleveland on April 21, 1892, L. 14.25 in. Ex. 23.25 in.

A male secured in Five Glacier Valley on April 23, L. 15.25 in. Ex. 26.62 in.

These birds were taken by Commander Peary with rifle ball, and the skins were too much mutilated for preserving.

25. *Falco islandus*. WHITE GYRFALCON. Eskimo, *Kerk-ker-she-wo-arho*.—From the deck of the "Kite" while she was at anchor in the harbor

of Godhaven, Disco Island, on June, 28 1891, I witnessed an attack on a flock of Domestic Pigeons by one of these birds. The pigeons, panic stricken, took refuge in houses or in fact anywhere they could secure shelter, while the falcon with lightning speed scoured the village.

A pair of these birds were seen at Cape Cleveland repeatedly and a female shot at Red Cliff House on September 24, 1891, measured L. 23 in. Ex. 51.75 in.

26. *Nyctea nyctea*. SNOWY OWL. Eskimo, *Opik-So-ak*.—The only individual seen was in Tucktoo Valley on September 19, 1891. At a distance it appeared snowy white, sitting sphinx-like on the top of a small fragment of a stranded berg. At first I thought I was looking at a strange bit of ice sculpture. The bird would not permit of near approach and flew into the valley, always alighting on a rock. After a "wild goose chase" of upwards of a mile, I had only the satisfaction of seeing it disappear in the distance.

The Eskimo suffix, "so-ak," meaning big, suggests the possibility that yet another owl is known to them—probably the Short-eared Owl. (See Hagerup's 'Birds of Greenland,' Little Brown & Co. 1891.)

27. *Corvus corax principalis*. NORTHERN RAVEN. Eskimo, *Tood-la-wah*.—A pair of these birds had a nest in an inaccessible niche, in the face of the brown trap rocky bluff which formed the northern boundary of the Glacier, at the head of McCormick Bay. The nest was probably five hundred feet above the sea, and little could be seen of it from our view point. I am fully satisfied that these birds do not all migrate in the fall because, after the sun had disappeared for the winter, we heard their hoarse croaking and five days before the sun reappeared, February 7, 1892, I saw in the dim twilight on the beach near our house a Raven lazily flopping along.

The old birds were extremely shy and difficult to approach, while it was quite the contrary with the young—they were trusting and inquisitive. At our boat camp in August, 1891, on Hakhuyt Island, some young birds alighting on the flat shelving rocks on which we were cooking our evening meal, literally walked into camp, and at distances of no more than fifteen feet, ate the entrails of Guillemots that we tossed to them. We found them playful and at the expense of "Jack," a Newfoundland dog, amused themselves by leading him a chase. The birds would allow "Jack" to approach within a few feet and then with a flop or a hop, would keep just out of his reach.

I noticed the same peculiarity of flight in the Northern Raven, that I had previously observed in the Raven inhabiting the Colorado Cañon in Arizona. The birds, when flying at considerable elevation and desiring to descend, would turn sidewise in the air, and drop in that position—frequently one hundred feet or more—before lighting. In the fall, I saw them in flocks numbering as high as thirty or forty birds.

The Ravens are omnivorous feeders. They are fond of such sea foods as they can gather, although they will eat seeds and berries when they can get them. One stomach examined was proof conclusive that they will not hesitate to take a Little Auk fledgling when they need it and they will attack the carcass of a Reindeer if left unprotected and, in a remarkably short time, inflict such damage to the skin, as to render it unfit for use. They will attack the carcass at the vent, but the real "piece de resistance" is the mangled, half digested salad with which the paunch is generally well filled.

In the summer time the Raven's glossy black plumage stands conspicuously opposed to the general theory of protective coloration, but, who will gainsay the complete appropriateness of a black Raven seeking the seclusion of the long arctic night?

28. *Acanthis hornemanni hornemanni*. GREENLAND REDPOLL?—Identification uncertain. A brood of young birds seen in Five Glacier Valley on August 12, 1892. Although able to fly, they were accompanied by parent birds, and I did not have the heart to shoot.

29. *Plectrophenax nivalis nivalis*. SNOW BUNTING. Eskimo, *Koop-a-new*.—By far the most common of the land birds. First heard at Red Cliff House May 1, 1892, and how that cheerful, flute-like song cheered us. It heralded Spring, and we all rushed out to hear it.

The parent birds conceal the nests for protection under shelving rocks and as they flush easily, the nests are readily found. All nests taken in South Greenland on our way north and at our headquarters in 1891, were built of grass neatly lined with Ptarmigan feathers; whereas, the nests taken within half a mile of Red Cliff House in the summer of 1892, were invariably lined with Reindeer hair shed from our clothing; showing that some birds do not always use what they prefer for building material but, from necessity, use what they can get.

When an Eskimo finds a nest he selects and plucks a long hair from his head and with dexterous fingers fashions a running noose, which is placed over the entrance to the nest, the other end fastened to some small growing plant or even a blade of grass. This fiendish device seldom fails to accomplish its cruel purpose, and shortly after will be found, fluttering helplessly, the parent bird. When the Eskimo returns, true to his brutal nature, he ends the struggle by biting off the bird's head and stripping the feathers from the breast, eats with a relish the little tender body that still runs a temperature.

Several nests were taken between June 19 and July 22, 1892; five and six eggs being an average clutch—one nest contained seven eggs. Last seen in September, 1891.

Schenectady, N. Y.

ON SOME NEW AND RARE BIRDS FROM COREA.

BY NAGAMICHI KURODA, *Rigaskushi*, M. O. S. J., H. F. A. O. U.

AND

TAMEZO MORI, M. O. S. J.

Dryobates major seoulensis subsp. nov.

DIAGNOSIS.—Near to *D. major tscherskii*, from Sakhalien Island, but distinguished from it by the under-parts more or less washed with very pale buff and the throat nearly always tinged with brown; by the ear-coverts being always tinged with pale brown, and by the occurrence of a dark phase like that of *hondoensis*. From *D. major hondoensis* Kuroda, from Hondo, it differs in having the under-parts generally paler even in the pale phase; the upper mandible broader at the base—11–12 mm. instead of 9.5–11 mm.—and the height of both mandibles greater at the front of the nasal plumes—8.5 mm. instead of 7–8 mm. It also differs from *D. major japonicus* from Hokkaido, by the occurrence of a dark phase, by the upper mandible being broader at the base—10.5–11.5 mm. in *japonicus*—and both mandibles higher at the front of the nasal plumes,—7.5 mm. in *japonicus*.

The type specimen is from Koryo near Seoul, central Corea. Adult male, April 22, 1917, No. 2694, coll. N. Kuroda. It is a specimen in the pale phase of plumage.

HABITAT.—Apparently confined to the Korean Peninsula.

MEASUREMENTS.—3 ♂♂: wing, 129–131; tail, 81.5–84; tarsus, 21–21.5; outer anterior toe, 14.5–15; outer posterior toe, 15.5–17; inner anterior toe, 11.5–12.5; inner posterior toe, 7; culmen, 29–30.5; width of upper mandible at base, 11.5–12; height of both mandibles at the front of nasal plumes, 8.5 mm.

4 ♀♀: wing, 128.5–131; tail, 81.5–87; tarsus, 21–22; outer anterior toe, 14–15.5; outer posterior toe, 15–17; inner anterior toe, 12–13; inner posterior toe, 7; culmen, 27.5–30; width of upper mandible at base, 11–11.5; height of both mandibles at the front of nasal plumes, 8.5 mm.

TYPE: wing 130.5; tail, 81.5; tarsus, 21; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 12.5; inner posterior toe, 7; culmen, 29; width of upper mandible at base, 12; height of both mandibles at the front of nasal plumes, 8.5 mm.

VARIATION.—A female obtained near Seoul, December 30, 1921, has four white spots on the outer web of the second primary. The fourth tail-feathers have no black bar on the webs and the

fifth or penultimate feathers have one black bar on the outer web and two on the inner web. It has, however, a wing measurement of 131 mm. only, not longer than the present form. We are inclined to think that these differences are due to rare individual variation.

The dark phase of the subspecies has the black barring on the tail feathers generally broader than in the pale phase of plumage.

***Dryobates major brevirostris* (Reichenbach).**

We have examined one specimen from Seoul, Corea, December 30, 1921, and another from Port Arthur, So. Manchuria, September 1911. Both specimens are referable to the present form rather than to *kamtschaticus*.

The innermost secondaries of the two specimens have no large white spots on the apical portion of the webs. Moreover, they have a longer wing and much thicker and broader bill than in specimens of *tscherskii* and other forms of the *major*-group in Japan and Corea.

It is probably a winter visitor from northern Siberia to these places and is apparently a very interesting new addition to the avifauna of Corea and Manchuria.

MEASUREMENTS.—1 ♀ (Corea): wing, 138; tail, 92; tarsus, 22.5; outer anterior toe, 14; outer posterior toe, 15.5; inner anterior toe, 11.5; inner posterior toe, 7.5; culmen, 29; width of upper mandible at base, 12.5; height of both mandibles at the front of nasal plumes, 9.5 mm.

1 ♂ juv. (Port Arthur): wing 138; tail, 85; tarsus, 22.5; outer anterior toe, 15.5; outer posterior toe, 16.5; inner anterior toe, 12; inner posterior toe, 6.5; culmen, 28; width of upper mandible at base, 12; height of both mandibles at the front of nasal plumes, 9.5 mm.

***Tetrastes bonasia coreensis*, subsp. nov.**

DIAGNOSIS.—♂ ad. Very similar to *T. bonasia amurensis* Riley, from Kirin Province, Manchuria, but distinguishable from it by the white margins of the chest-feathers being nearly uniformly tinged with gray-rufous and forming a chest-band and the blackish bands finer. In *amurensis*, the rufous tinge is confined to the lower fore-neck only. The crown

of the head and hind-neck are more ashy in tinge and without the distinct rufous color which exists in *amurensis*. It differs from *T. bonasia vicinatas* Riley from Hokkaido, Japan, by the head and hind-neck being more ashy instead of deeper rufous, by the bands on mantle being distinctly black instead of brownish, by the white margins of the chest-feathers being distinctly suffused with gray-rufous, and by the black bands on the tail-feathers being broader.

The female differs from that of *vicinitas*, by the chest being decidedly rufous, by the black spots of the feathers on the crown more extended, by the hind-neck and mantle being rufous with very broad black bands and the margin of the feathers grayish, by the central tail-feathers being darker and the bars black instead of brown, and by the much stouter bill.

We have no example of the female of *amurensis* for comparison with those of *vicinitas* and *corensis*.

The type specimen is from Kogen Distr., Corea. Adult male, January, 1921. It is preserved in the first Higher Common School in Seoul.

HABITAT.—Probably confined to the mountainous parts of Corea.

MEASUREMENTS.—4 ♂♂: wing, 159–169; tail, 117–136; tarsus, 36.5–39; culmen, 24–25.5; bill from nostril, 11–12; width of black band on the outer-most tail-feathers, 16–20 mm.

3 ♀♀: wing, 164–169; tail, 119–120; tarsus, 38–39; culmen, 23–23.5; bill from nostril, 11.5; width of black band on the outermost tail-feather, 17–18 mm.

TYPE.—wing, 168; tail, 136; tarsus, 36.5; culmen, 25.5 bill from nostril 12; width of black band on the outermost tail-feathers, 20 mm.

A male from Kogen District, Corea, November 3, 1914, has its chest nearly like that of *amurensis* from Kirin, Manchuria, but the crown and hind-neck more ashy than rufous, and the mantle very heavily barred with black. We are inclined to think that the difference is probably due to individual variation.

Fukuyoshi Cho, Akasaka, Tokyo, Japan.

RECENT NOTES FROM AN OLD COLLECTING
GROUND IN NORTH-EASTERN ILLINOIS.

BY COLIN CAMPBELL SANBORN.

SOME years ago the late John Farwell Ferry in his paper on 'Ornithological Conditions in North-eastern Illinois, with some Notes on Winter Birds' (*Auk*, Vol. XXIV, No. 2) called attention to Beach as an old Illinois collecting ground, where such men as Robert Kennicott, Fred T. Jencks, E. W. Nelson, Thomas H. and Charles Douglas, and Henry K. Coale had collected, some of their records dating back to 1853.

After nearly seventy years, however, its value as a collecting ground is almost gone and in a few years more the Beach of yesterday will have passed forever. The proposal to add Beach to the Forest Preserve was voted down at a recent election. Factories are steadily creeping up from Waukegan on the south. And some specimens taken at Beach show the effects of their closer approach as they are soiled by smoke and soot. The pines are being cut down for Christmas trees or to be used as blinds by duck hunters and fires have killed many of them and most of the junipers.

Mr Ferry gave a complete history and description of this region which I shall not repeat, but shall give a general idea of the country which will make references easy to follow. Beach lies forty miles north of Chicago in Lake County in the extreme north-eastern corner of the State, and stretches seven miles due north of Waukegan, a growing manufacturing town. It averages about a mile in width, with Lake Michigan on one side, and a high bluff, which is characteristic of the region north of Chicago, on the other. Along the lake stretch low sand ridges, and west of these is a large swamp, the open water of which is locally known as Dead Lake. This swamp drains into Lake Michigan through Dead River on the north and Little Dead River, which has now been dredged out to form a large harbor, on the south. South of Dead River the sand ridges are covered with rows of pines, and north, next the lake, with low juniper bushes, which on the west merge into thick oak scrub.

Beach has no deep hollows for a protection from the wind and no great food supply, so winter birds seem to make it just a temporary stopping place before passing to the Sand Dunes of Indiana about ninety miles south. It is only by chance then that they are found there and, although I have been very fortunate in this respect, there were many trips upon which, I have seen only a few Tree Sparrows and Crows. Inasmuch as this is the only wild bit of lake shore in northeastern Illinois it affords a natural feeding ground for many of the shorebirds.

During the past seven years that I have been collecting at Beach, I have made a number of records which I wish to add to the already long list from that locality. Some of these have already been reported in 'The Auk,' but as I have enlarged upon them, I take the liberty of repeating them. I wish to thank the members of the Chicago Ornithological Society for their co-operation in assisting me with certain of these records.

1. *Nycticorax n. naevius*. BLACK-CROWNED NIGHT HERON.—On January 4, 1921, Mr. Henry Kern, the local game warden, arrested a hunter who had just shot an immature bird of this species. The specimen later came into the possession of Dr. C. W. G. Eifrig who reported the record.

2. *Tryngites subruficollis*. BUFF-BREASTED SANDPIPER.—October 2, 1921, I was attracted by the very long wings of a shorebird as it alighted a short distance down the beach. It proved to be a female of this species which is now in Mr. Coale's collection. Mr. Benjamin T. Gault and George P. Lewis reported two birds seen a number of times at the Lincoln Park beach in Chicago, early in September. As far as I can find, these are the first published records since 1898. (William A. Bryan, Auk, Vol. XVI.)

3. *Squatarola squatarola*. BLACK-BELLIED PLOVER.—Mr. George Stagg and I secured a pair of these birds October 7, 1920. They were in immature plumage and easily approached. This year (1921) I found a flock of twelve on the beach all through September and part of October. These were mostly immatures with three or four adults which kept a sharp watch and made it difficult to get within gun range. It is now rather a rare migrant here.

4. *Charadrius melodus*. PIPING PLOVER.—These birds first came to my notice on May 31, 1920, when I spent some time watching two pair, but my efforts to find a nest were unsuccessful. On June 5, I brought Mr. Edward R. Ford with me, who succeeded in locating a nest with four eggs

just hatching. Another pair, Mr. Ford decided, had probably had their first nest destroyed and would, no doubt nest again, so on June 12, I made a further search and was rewarded by flushing the bird from two eggs and on the 17th, collected the full complement of four. This is another species that was once common but is now rather rare. No birds were seen this year (1921).

5. **Falco c. columbarius.** PIGEON HAWK.—While hunting with Mr. George Stagg on October 12, 1920, he shot a male of this species on the wing; another was taken by Mr. Stephen S. Gregory on October 16, 1921. Most of the old writers give this bird as a common migrant but after talking to a number of collectors who have been very active in this region during the past ten years, I am convinced from their records that this species is now an uncommon migrant. Mr. Stagg also shot a Sharp-shinned Hawk the same day, a species which is a little more common than the former.

November 2, 1920, two friends of mine, Mr. Lyman Barr and Mr. George Stagg, reported an interesting observation to me. They were sitting on the beach when they saw a large hawk flying over the lake, where there were many flocks of ducks. The hawk suddenly swooped at the ducks which sent a shower of water into the air with their wings and drove him away. He tried flock after flock but each time met with the same defense and finally disappeared from sight. I have no doubt that this was a Duck Hawk but as I cannot definitely report it as such, thought that I would relate the incident and let the readers make their own identification.

6. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—During the fall of 1920 the Chicago area was visited by a flight of this species, about sixteen being reported at different times. Previously there were only three records, to my knowledge, for the State, viz: one taken in Chicago by Dr. J. W. Velie in 1876; another later at Philo, Illinois, by Isaac E. Hess; and the third seen by Eliot Blackwelder at Morgan Park in 1894. The recent records are:

October 7, while at Beach, Mr. Stagg called my attention to a woodpecker which, when taken, proved to be a female Three-toed.

October 31, Mr. Karl W. Kahman, a taxidermist of Chicago, came into possession of a female which had been shot by a boy west of Evanston.

November 20, I saw a female on one of the main streets of Evanston and later heard of one being seen near there, probably the same bird.

November 26, Mr. Edward R. Ford observed a female on a busy street on the north-west side of the city.

Mr. H. L. Stoddard has already reported a number from the Sand Dunes in Indiana (Auk, Vol. XXXIV, No. 4 and Vol. XXXVIII, No. 1) to which I wish to add another taken by him November 21, 1920, and three reported by Dr. C. W. G. Eifrig, November 26. Five others were also

reported from the Dune country during October and November. All birds reported from Illinois were females while those from Indiana, with two exceptions, were males.

7. *Colaptes auratus luteus*. NORTHERN FLICKER.—One seen February 6, 1921. I have seen this bird in the Sand Dunes in Indiana in February but this is my first winter record for Illinois.

8. *Agelaius p. phoeniceus*. RED-WINGED BLACKBIRD.—An abundant summer resident but I was surprised to find one on December 17, 1917. It was shot by Mr. Stoddard and proved to be a male in good condition.

9. *Sturnella magna*. MEADOWLARK.—February 13, 1921, one seen near Dead Lake. A number of others were reported from different parts of the area due no doubt to the warm winter. I have questioned the species as three forms occur here, *magna* and *m. argutula* being about equally abundant and *neglecta* occasionally reported.

10. *Loxia curvirostra percna*. NEWFOUNDLAND CROSSBILL.—I first met with these birds on October 29, 1916, a cold, disagreeable day, with a strong north wind and occasional flurries of rain and snow. I did not expect to see much of interest on such a day but arriving at Beach I found large flocks of birds in the pines, which I soon identified through my glasses, as Crossbills. Due to the wind and the wildness of the birds, it was late in the afternoon before any were taken. Then I found three in the top of a pine and shot one. To my surprise the others did not leave so I took them both. This behavior proved to be typical from my experience with them later. When in large flocks they are wild or restless and hard to approach but when only two or three are together they can almost be caught by hand.

Mr. Coale and I had noticed the difference between these birds and *minor*, so with Mr. Stoddard we again visited Beach, November 5, and found the Crossbills still plentiful. They were feeding quietly in the pines and were not easy to see. One White-winged Crossbill seen among them is my only record for 1916. On subsequent trips, on November 19 and 26, and December 3, we found *percna* in large flocks; December 17, none were seen. The last record was January 11, 1917, when Mr. John Douglas sent one to Mr. Coale in the flesh.

During the next two years I was in the army so Mr. Coale kindly took up the work of identifying the Crossbills. He writes as follows:

"I am glad to be able to identify the large Crossbills we took at Beach, Illinois, October 1916 to January 1917, as the Newfoundland Crossbill, *Loxia curvirostra percna*, described by Mr. Bent in 1912. (Smithsonian Misc. Coll., Vol. 60, No. 15.)

"A number of specimens of *Loxia* from Illinois, Wyoming and Europe were sent with some of the new form to ornithologists for comparison. I quote from some of their letters:

"Mr. Robert Ridgway: 'You can safely label your specimens *Loxia curvirostra percna*, and the Wyoming birds *Loxia curvirostra bendirei*.'

"Dr. Witmer Stone: (who at the time had no others of the new race for comparison), 'I have no doubt that those obtained in 1916 in Illinois, are *Loxia c. percna*, the two little ones are of course *minor*, the Wyoming birds *bendirei*, and the European specimens true *curvirostra*.'

"Mr. J. H. Riley: 'I have shown your Crossbills to Mr. Oberholser, who is of the opinion that the large Illinois birds are *Loxia c. percna* Bent.'

"Mr. Bent: 'The box of Crossbills is very interesting. I have not had time to examine them critically, but off hand I should say that the two birds so marked are undoubtedly '*percna*.'

"In January, 1921 I had the pleasure of visiting several of the large eastern museums, and further confirmed the fact already established, that the large Illinois birds are *percna*."

Measurements given below were taken from fresh specimens before skinning (all collected at Beach):

H. K. C. No.	<i>Loxia c. minor.</i>		Average
22630 F. Nov. 30, 1919.	Length 5.6 in.	Extent 9.7 in.	2 females
10774 F. Nov. 9, 1906.	Length 6. in.	Extent 10.75 in.	L. 5.8
10772 M. Nov. 9, 1906.	Length 6 in.	Extent 10.50 in.	Ex. 10.23
			2 males
22629 M. Nov. 30, 1919.	Length 5.75in.	Extent 9.75 in.	L. 5.87
			Ex. 10.13
	<i>Loxia c. percna.</i>		Average
20452 M. Oct. 29, 1916	Length 7 in.	Extent 11.25 in.	3 males
20489 M. Dec. 3, 1916	Length 6.5 in.	Extent 11.10 in.	L. 6.83
20610 M. Jan. 11, 1917	Length 7. in.	Extent 10.20 in.	Ex. 11.18
			2 females
20484 F. Nov. 26, 1916	Length 6.5 in.	Extent 11.30 in.	L. 6.66
20153 F. Oct. 29, 1916	Length 6.82 in.	Extent 11.20 in.	Ex. 11.25

A number of other specimens of *percna* taken from the same flock are in the collections of the Field Museum (in the Harris Extension Coll.) and of Mr. E. E. Armstrong of Chicago.

11. *Acanthis l. linaria*. REDPOLL.—This winter (1920–21) is the first year for some time that I have not seen Redpolls. They were formerly here from early fall to late spring.

12. *Spinus pinus*. PINE SISKIN.—December 26, 1915, I found large flocks feeding in the weed patches. Have not seen many since although they have been reported commonly from the Dunes.

13. *Plectrophenax n. nivalis*. SNOW BUNTING.—Very common during the fall of 1916, from October to January; not many seen again until 1920, when they were here once more in large numbers.

14. *Spizella p. passerina*. CHIPPING SPARROW.—This was a very common bird about Chicago before the English Sparrow was introduced;

now it is only locally common. Beach is one place where it still holds its own. They first came to my notice on June 12, 1915, when with Mr. W. A. Goelitz we found three nests, one with large young, and two with fresh eggs. Another nest was found June 5, 1920. Mr. Coale has taken only one specimen near Highland Park.

15. *Junco hyemalis connectens*. SHUFELDT'S JUNCO.—One taken March 19, 1916 from a flock of *hyemalis*. There are only two other records for the State that I know of. February 20, 1887, Mr. H. K. Coale took a male at Waukegan (Auk, Vol. IV, page 330) and on December 16, 1892, Mr. William E. Praeger took one on the Illinois shore opposite Keokuk, Iowa, no sex given. (Auk, Vol. XII, No. 1).

16. *Melospiza l. lincolni*. LINCOLN'S SPARROW.—A specimen collected by Mr. Stephen S. Gregory, December 26, 1920. It is a fairly common migrant but I know of no other winter record.

17. *Lanius borealis*. NORTHERN SHRIKE.—Mr. Stephen S. Gregory reported one of these birds December 26, 1920. Another was caught at Waukegan by Mr. W. I. Lyons who has been doing extensive trapping and banding work. The Shrike entered the trap after a Junco which it killed. It is a rare winter resident.

18. *Bombycilla garrula*. BOHEMIAN WAXWING.—There was a large flight of Waxwings during the winter of 1919-20. (Auk, Vol. XXXVII, No. 2.) Mr. H. L. Stoddard and I were in the pines the day many of them arrived, November 30, from six-thirty until noon, during which time flocks of fifty to one hundred passed steadily every five or ten minutes. There was a high wind and the birds were very restless swirling about like snowflakes, dropping down near a dead tree as if to alight, and then swinging up and away to the south. A flock stopped now and then to feed but for the most part the birds were migrating, following the edge of the Lake, for none were seen more than a quarter of a mile from the beach. Once about seventy-five birds lit on the frozen surface of Dead River, making a picture I shall long remember, but it was for only a minute as the last ones had hardly alighted when the first were up and away. We estimated that about fifteen hundred of the birds passed that day.

December 3, I found only one stray Waxwing, but on December 31, there were two large flocks present, about one hundred and fifty birds. This was the last time they were seen at Beach but were found throughout the winter in the Sand Dunes.

19. *Dendroica vigosii*. PINE WARBLER.—These Warblers used to breed at Beach a good many years ago, but at present are rare even as migrants. My only record is a male taken May 7, 1921.

20. *Lanivireo s. solitarius*. BLUE-HEADED VIREO.—One taken November 5, 1916, a very late record for this region.

21. *Baeolophus bicolor*. TUFTED TITMOUSE.—Mr. Coale took one November 5, 1916. There are a few seen every year and one record of a

pair breeding at Lake Forest. They seem, like the Cardinal, to be gradually extending their range to the north.

22. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Very common during the falls of 1915, 1916 and 1921. Other years only a few have been seen.

23. *Poliophtila c. caerula*. BLUE-GRAY GNATCATCHER.—Some years a very common migrant during May. A male was taken May 31, 1920 in the oak scrub and later the same day and throughout June a female was seen in the pines, generally in the same place and always uttering a plaintive call. I spent a great deal of time watching her on different occasions but if there was a nest it was never found. Dr. Eifrig reported seeing several May 30, 1921, and I intended making a search for a nest but my trip was delayed until July 24. On this date, I had just started through the oak scrub when I heard the call of the Gnatcatcher and found five in a small oak, two adults and three young. The young were almost fully grown and were catching insects for themselves but I saw the parents feed them a number of times. When the old birds approached the young opened their mouths and quivered their wings. This is a rare breeder in north-eastern Illinois but is more common in the Sand Dunes in Indiana.

24. *Hylocichla g. guttata*. ALASKA HERMIT THRUSH. Mr. Coale took this bird November 5, 1916, and has already reported it in 'The Auk' (Vol. XXXIV, No. 1) being the first record east of the Rockies.

25. *Planesticus m. migratorius*.—ROBIN. Robins sometimes spend the winter in this region; seen December 31, 1914 and February 18, 1917.

P. O. Box 55, Chicago, Ill.

THE ROLE OF THE "ACCIDENTAL."*

BY JOSEPH GRINNELL.

The total number of species and subspecies of birds recorded upon definite basis from California amounts at the present moment to 576. Examination of the status of each species, and classification of the whole list according to frequency of observation, show that in 32 cases out of the 576 there is but one occurrence known. In 10 cases the presence of the species has been ascertained twice, in 6 cases three times, and for all the rest there are 4 or more

* Contribution from the Museum of Vertebrate Zoology of the University of California.

records of occurrence. Some 500 species can be called regularly migrant or resident.

Examination of the records for the past 35 years shows that the proportion of one-occurrence cases is continually increasing. In other words, the state is so well known ornithologically that regular migrants and residents have all or nearly all of them been discovered, and *their* number now remains practically constant, while more and more non-regulars are coming to notice. This might be explained on the ground that there are continually more and better-trained observers on the lookout for unusual birds. This is probably correct, partially. But also, I believe, there is indicated a continual appearance, within the confines of the state, through time, of additional species of extra-limital source.

In published bird lists generally, species which have been entered upon the basis of one occurrence only, are called "accidentals." This is true of county lists, of state lists, and, quite patently, of the American Ornithologists' Union's 'Check-list of North American Birds'. The idea in the adoption of the word "accidental" seems to have been that such an occurrence is wholly fortuitous, due to some unnatural agency (unnatural as regards the behavior of the bird itself) such as a storm of extraordinary violence, and that it is not likely to be repeated. This understanding of the word "accidental" is borne out by the explicit meaning given it in the 'Century Dictionary,' for instance, which is "taking place not according to the usual course of things," "happening by chance or accident, or unexpectedly." Now the way in which the word is used by ornithologists is really a misapplication of the term; for, as I propose to show, the occurrence of individual birds a greater or less distance beyond the bounds of the plentiful existence of the species to which they belong is the *regular thing, to be expected*. There is nothing really "accidental" about it; the process is part of the ordinary evolutionary program.

However, as I have intimated, the word is firmly fixed in distributional literature. We had better continue to use it; but let us do so with the understanding that it simply means that any species so designated has occurred in the locality specified on but one known occasion. No special significance need to be implied.

Accidentals are recruited mostly from those kinds of birds which are strong fliers. It is true that the majority belong to species of distinctly migratory habit. But some of our accidentals exemplify the most sedentary of species. Examples of one-instance occurrences, in other words "accidentals," are as follows: the Western Tanager in Wisconsin, the Louisiana Water-Thrush in southern California, Townsend's Solitaire in New York, the Catbird on the Farallon Islands, the Tennessee Warbler in southern California, and Wilson's Petrel on Monterey Bay. In the North American list some of the accidentals come from South America, some even from Asia and from Europe.

I would like to emphasize the point now that there is no species on the entire North American list, of some 1250 entries, that is not just as likely to appear in California sooner or later as some of those which are known to *have* occurred. Expressing it in another way, it is only a matter of time theoretically until the list of California birds will be identical with that for North America as a whole. On the basis of the rate for the last 35 years, $1\frac{2}{3}$ additions to the California list per year, this will happen in 410 years, namely in the year 2331, if the same intensity of observation now exercised be maintained. If observers become still more numerous and alert, the time will be shortened.

It will be observed that there are now many more one-occurrence, "accidental," cases than there are two-occurrence cases, and that there are more of the two-occurrence group than there are three-occurrence, and so forth, there being a regular reduction in the intervals so that, if we just had enough observations, a smooth curve would probably result. If the one-instance occurrences should continue to accumulate without any modification of the process, in the course of about 300 years there would be more of these "accidentals" in California than of regularly resident species, and the other groups would grade down in a steeper curve. I attempted to carry out the figures, which seem to behave according to some mathematical formula; but when I came to deal with $\frac{2}{3}$ of an occurrence I decided it was profitless to go on!

It is evident, however, that another process takes place, of quite opposite effect. With the lapse of time second-occurrence

cases replace one-occurrence cases, to be followed by a third order of accretion, and this by a fourth; and the process might continue on ad infinitum, until theoretically, sometime after the full number of the North American list had been reached, our state list would no longer contain any accidentals at all. To cite an example, the eastern White-throated Sparrow was recorded first from California, and then as an accidental, on December 23, 1888; in 1889 a second specimen was taken; in 1891, a third was taken; and so on until in 1921, 19 occurrences have been recorded. This species is considered now simply as rare, certainly not accidental, casual, or even specially noteworthy save from a very local standpoint.

It comes to the mind here that if observations could be carried on so comprehensively as to bring scrutiny each year of every one of the 200,000,000 birds in California, this being the estimated minimum population maintained within the state from year to year, a great many more accidentals would be detected than are now known, and in addition some birds now known from but a few records, or even as accidentals, would come to be considered of frequent, though not necessarily regular, occurrence. With the White-throated Sparrow it is not impossible that a thousand of the birds have wintered in California in certain years.

Some of the considerations in the preceding paragraphs, while of interest in themselves perhaps, have confessedly been rather beside the issue. For the definite question which I wished to ask and which I will now briefly discuss is as to the function or role played by accidentals. Are they a mere by-product of species activity or do they in themselves constitute part of a mechanism of distinct use to the species?

The rate of reproduction in all birds, as with other animals, is so great that the population rapidly tends toward serious congestion except as relieved by death of individuals from various causes or else by expansion of the area occupied. The individuals making up a given bird species and occupying a restricted habitat may be likened to the molecules of a gas in a container which are continually beating against one another and against the confining walls, with resulting pressure outwards. But there is an essential difference in the case of the bird in that the number of individual

units is being augmented 50 per cent, 100 per cent, in some cases even 500 per cent, at each annual period of reproduction, with correspondingly reinforced outward pressure.

The force of impingement of the species against the barriers which operate to hem it in geographically, results in the more than normally rapid death of those individuals which find themselves under frontier conditions. There follows, through time and space both, a continual flow of the units of population from the center or centers toward the frontiers.

The common barriers which delimit bird distribution are as follows: Land to aquatic species and bodies or streams of water to terrestrial species, the climatic barriers of temperature, up or down beyond the limits to which the species may be accustomed, and of atmospheric humidity beyond critical limits of percentage; the limits of occurrence of food as regards amount and kind with respect to the inherent food-getting and food-using equipment of the species concerned; and the limits of occurrence of breeding places and safety refuges of a kind prescribed by the structural characters of the species requiring them.

An enormous death rate results from the process of trial and error where individuals are exposed wholesale to adverse conditions. This can be no less, on an average, than the annual rate of increase, if we grant that populations are, on an average, maintaining their numbers from year to year in statu quo. But before the individuals within the metropolis of a species succumb directly or indirectly to the results of severe competition, or those at the periphery succumb to the extreme vicissitudes of unfavorable conditions of climate, food or whatnot obtaining there, the latter have served the species invaluablely in *testing out* the adjoining areas for possibly new territory to occupy. These *pioneers* are of exceeding importance to the species in that they are continually being centrifuged off on scouting expeditions (to mix the metaphor), to seek new country which may prove fit for occupancy. The vast majority of such individuals, 99 out of every hundred perhaps, are foredoomed to early destruction without any opportunity of breeding. Some few individuals may get back to the metropolis of the species. In the relatively rare case two birds comprising a pair, of greater

hardihood, possibly, than the average, will find themselves a little beyond the confines of the metropolis of the species, where they will rear a brood successfully and thus establish a new outpost. Or, having gone farther yet, such a pair may even stumble upon a combination of conditions in a new locality the same as in its parent metropolis, and there start a new detached colony of the species.

It is this rare instance of success that goes to justify the prodigal expenditure of individuals by the species. Such instances, repeated, result in the gradual extension of habitat limits on the part especially of species in which the frontier populations are in some degree adaptable—in which they can acquire modifications which make them fit for still farther peripheral invasion against forbidding conditions.

Incidentally, the great majority of these pioneers are, I believe, birds-of-the-year, in the first full vigor of maturity; such birds are innately prone to wander; and furthermore it is the autumnal season when the movement is most in evidence, a period of foodlessening when competitive pressure is being brought to bear upon the congested populations within their normal habitats. The impetus to go forth is derived from several sources.

The "accidentals" are the exceptional individuals that go farthest away from the metropolis of the species; they do not belong to the ordinary mob that surges against the barrier, but are among those individuals that cross through or over the barrier, by reason of extraordinary complement of energy, in part by reason of hardihood with respect to the particular factors comprising the barrier, and in part of course, sometimes, through merely fortuitous circumstances of a favoring sort.

Geologists tell us that barriers of climate are continually moving about over the earth's surface, due to uplift and depression, changes in atmospheric currents, and a variety of other causes. Animal populations are by them being herded about, as it were, though that is too weak a word. The encroaching barrier on the one side impinges against the population on that side; the strain may be relieved on the opposite side, if the barrier on that side undergoes parallel shifting, with the result that the species

as a whole may, through time, flow in a set direction. If anything should happen that a barrier on one side impinged on a species without corresponding retreat of the barrier on the other side, the habitat of the species would be reduced like the space between the jaws of a pair of pliers, and finally disappear: the species would be extinct.

But, in the case of persistence, it is the rule for the population, by means of those individuals and descent lines on the periphery of the metropolis of the species, to keep up with the receding barrier and not only that but to press the advance. I might picture the behavior of the population of a given bird as like the behavior of an active amoeba. This classic animal advances by means of outpushings here and there in reaction to the environment or along lines of least resistance. The whole mass advances as well. The particles of protoplasm comprising the amoeba may be likened to the individuals comprising the entire population of the animal in question, the mass of the amoeba to the aggregate of the population.

It is obvious that the interests of the individual are sacrificed in the interests of the species. The species will not succeed in maintaining itself except by virtue of the continual activity of pioneers, the function of which is to seek out new places for establishment. Only by the service of the scouts is the army as a whole able to advance or to prevent itself being engulfed: in the vernacular, crowded off the map—its career ended.

The same general ideas that I have set forth with regard to birds, who happen to be endowed with means of easy locomotion, hold, I believe, also for mammals, and probably in greater or less degree for most other animals. I can conceive of a snail in the role of an "accidental," an individual which has wandered a few feet or a few rods beyond the usual confines of the habitat of its species. Given the element of time (and geologists are granting this element in greater and greater measure of late), the same processes will hold for the slower moving creatures as they seem to do for those gifted with extreme mobility.

Migration, by the way, looks to me to be just a phase of distribution, wherein more or less regular seasonal shifting of popula-

tions takes place in response to precisely the same factors as hem in the ranges of sedentary species.

The continual wide dissemination of so-called accidentals, has, then, provided the mechanism by which each species as a whole spreads, or by which it travels from place to place when this is necessitated by shifting barriers. They constitute sort of sensitive tentacles, by which the species keeps aware of the possibilities of areal expansion. In a world of changing conditions it is necessary that close touch be maintained between a species and its geographical limits, else it will be cut off directly from persistence, or a rival species, an associational analogue, will get there first, and the same fate overtake it through unsuccessful competition—supplantation.

Museum Vert. Zool., Univ. of California, Berkeley, Calif.
(September 7, 1921.)

NOTES ON FOOD HABITS OF THE SHOVELLER OR SPOONBILL DUCK (*SPATULA CLYPEATA*).

BY W. L. MCATEE.

REPORTS have been made by the Biological Survey upon the food habits of all of the shoal-water ducks of the United States except the Shoveller. McAtee wrote the accounts¹ of the Mallard, Black Duck and Southern Black Duck, and Mabbott those² of the Gadwall, Baldpate, European Widgeon, Green-winged, Blue-winged and Cinnamon Teals, Pintail and Wood Duck. The Shoveller would have been included in the latter report had the author returned from war. However, design as well as fate had to do with the omission; truth is that the food habits of the Spoonbill duck are more difficult to study than those of any other anatine species yet investigated and the work, therefore, was postponed to the last. Even so the pioneer analyses by McAtee have not yet been supplemented and these are here reported upon so that some data on the food habits of the Shoveller will be available, and the

¹ U. S. Dept. Agr. Bull. 720, 35 pp., 1 Pl. Dec. 1918.

² U. S. Dept. Agr. Bul. 862, 67 pp., 7 pls. Dec. 1920.

dietetic reports upon a major group of our wild ducks made measurably complete.

Popularly the Spoonbill is reputed to feed upon mud and three of the local names of the bird emphasize this belief, namely, "mud duck," "mud lark," and "mud shoveller." With respect to mud, the pure thing itself, can scarcely be considered as nutritious, but the material referred to in common parlance as the pabulum of mud-eaters, is bottom ooze composed largely of more or less decayed vegetable debris often containing large numbers of minute plants and animals such as diatoms and ostracods. There is little doubt that these small organisms supply most of the nutriment in the so-called mud found in alimentary tracts of shovellers. The broadening of the bill of this bird, the multiplication of the straining lamellae and elongation of the intestine, all are specializations for nutritive utilization of minute organisms, and while the Spoonbill takes more of this kind of food than other ducks, it does not habitually profit by its specializations, as only about 15, certainly not to exceed 20 per cent of the birds examined had fed on bottom ooze.

For the present study of the food habits of the species, gizzards (some with crops) of 84 Shovellers have been examined. These were collected in 12 states with Texas most heavily represented by 25, but with 5 or more each from Colorado, California, Arkansas, Louisiana, South Carolina, and Florida. They were collected in all months from August to April inclusive, the largest numbers being taken in November and February. Fourteen of the total number of stomach contents analyzed were rejected, because of insufficiencies of various kinds, thus leaving 70 upon which the percentages of food items here cited are based.

Tabulating the food items of these 70 Spoonbills in the simplest way, (i. e. without attempting to eliminate errors due to inequalities in geographic and seasonal distribution of the specimens) we find that 65.76% of the total food is of vegetable and 34.24% of animal origin. This is a higher proportion of animal food than taken by any of the other shoal water ducks with the sole exception of the Southern Black Duck, a species living where animal food is plentifully available all the year.

The largest item of animal food is molluscs, practically all of them fresh-water univalves. They constituted 18.97% of the total or more than half of the animal food of the Shoveller. No fewer than 280 *Physa heterostropha* were counted in one stomach contents and 1100 *Amnicola floridana* in another. Unidentified snails were found in 29 of the 84 stomachs examined and the following identified kinds in the number stated in connection with each:

<i>Amnicola floridana</i>	2	<i>Lymnaea</i> sp.....	1
<i>Amnicola limosa</i>	1	<i>Planorbis exacuus</i>	1
<i>Amnicola porata</i>	1	<i>Planorbis parvus</i>	4
<i>Amnicola</i> sp.....	2	<i>Planorbis trivolvis</i>	1
<i>Neritina reclivata</i>	4	<i>Physa heterostropha</i>	2
		<i>Physa</i> sp.....	2

Aquatic insects are next in importance in the regimen of the Spoonbill Duck, water-bugs contributing 3.64% to the diet and water-beetles, caddis larvae, dragon-fly nymphs, and all other insects together about one per cent each. The water bugs were chiefly water boatmen (*Corixidae*) found in 9 stomachs. These small creatures swarm over the bottom ooze and play an important part in transforming nutriment gathered there into meat much sought by higher forms. Other water-bugs captured by the Spoonbill include back-swimmers (*Notonectidae* among them *Notonecta undulata*), one of the medium-sized species of "giant water-bugs" (*Zaitha*) and a water scorpion (*Ranatra*).

The water beetles eaten are chiefly small species, but include a few of the highly predaceous larvae known as water-tigers (*Dytiscidae*). A list of the water-beetles identified from Shoveller stomachs is:

<i>Halplus punctatus</i>	1	<i>Dytiscidae</i>	3
<i>Halplus ruficollis</i>	1	<i>Berosus</i> sp.....	3
<i>Halplus</i> sp.....	1	<i>Tropisternus</i> sp.....	2
<i>Bidessus pullus</i>	1	Water-beetles (further	
<i>Bidessus</i> sp.....	1	unidentified).....	4
<i>Hydroporus</i> sp.....	1		

Caddis larvae and their cases and dragon-fly nymphs are most numerous among the other insects preyed upon, but there is nothing of special note regarding them, nor were any of them identified. The remaining insects included larvae of midges,

soldier-flies, horse-flies, may-flies, a hymenopteron, and a bird louse, of a species (*Lipecurus squalidus*) known to infest the Shoveller. Not insects but more closely allied to them than to other orders are the water-mites (Hydrachnidae) which were identified from 5 stomachs.

Remains of small fishes composed nearly 3 per cent of the food of the Shovellers examined; in one case 6 small carp (*Cyprinus carpio*) had been taken by a single bird. Crustaceans make up the balance of the animal food and although 2 crawfishes were among them the great bulk was made up of those minute bivalved forms known as Ostracods together with a few of the naked Copepods. In one instance hundreds of Ostracods had been consumed as part of one meal. In the case of a Shoveller collected at South Island, S. C., March 31, 1905, a male specimen of a new species of *Ilyodromus* was identified by Dr. R. W. Sharpe of New York, who stated that the genus had not previously been reported from North America and that no male had ever before been found. The names of the Ostracods identified and the number of stomachs in which found are:

<i>Candona sigmoides</i>	1	<i>Cypris pellucida</i>	2
<i>Candona simpsoni</i>	2	<i>Cypridopsis vidua</i>	1
<i>Candona</i> sp.....	3	<i>Cythere</i> sp.....	1
<i>Cypria dentifera</i>	2	<i>Ilyodromus</i> sp.....	1
		<i>Potamocypris smaragdina</i>	1

Foraminifera were found in a single stomach from the Mississippi Delta, and oligochaete worms in two.

The approximate two-thirds of the diet of the Shoveller derived from the vegetable kingdom is drawn from numerous plant families none of which is of really preponderating importance. A fair share of the total course is composed of the macerated plant debris which is so important a constituent of the bottom ooze. Aside from this indeterminate material the leading items are: sedges, 16.02%; pondweeds, 11.25%; grasses, 8.28%; algae, 6.55%; waterlilies, 2.5%; duckweeds, 1.7%; and smartweeds, 1.1%. Chiefly the seeds of sedges are eaten, those most in favor being bulrush (*Scirpus*) and saw-grass (*Mariscus*). About 200 seeds of the latter plant were found in one stomach. The pondweeds consumed were mostly *Potamogeton* and widgeon grass (*Ruppia*)

of each of which more than 150 seeds were counted in single gizzards, but of another genus of this family, the horned pondweed (*Zannichellia*) more than 1600 seeds were taken by one bird at a meal. The grasses identified in the Shoveller's food were mostly switch-grasses (*Panicum*), and cultivated rice. However the seeds of the latter eaten were shattered grain gleaned in the fields in winter, and their consumption is a benefit since volunteer rice is very objectionable. About 300 seeds of a beach grass (*Monanthochlœ littoralis*) were found in one stomach. The algae determined were musk-grasses (*Chara*) but filamentous algae not identified are just as important a proportion of the food. Diatoms were detected in 2 stomachs. Seeds of water-lilies, largely those of water-shield (*Brasenia*) and stolons of the banana waterlily (*Castalia mexicana*) represent this family in the Shoveller's diet; duckweeds (*Lemnaceae*) are eaten entire, and seeds again of smartweeds are the portion sought. The only other item of plant food worthy of special note is the velvet duckweed (*Azolla caroliniana*), a fern ally growing on the water surface of southern swamps, specimens of which composed nearly half of the contents of one stomach; it seems to be rarely eaten by birds.

Items of vegetable food and number of stomachs in which found:

Diatoms.....	2	Foxtail grass (<i>Chaetochloa</i> sp.).....	1
Musk-grass (<i>Chara</i> sp.).....	3	Rice cut-grass (<i>Leersia oryzoides</i>)..	1
Unidentified algae.....	7	Rice (<i>Oryza sativa</i>).....	4
Velvet duckweed (<i>Azolla carolini-</i>		Beach grass (<i>Monanthochloë littora-</i>	
<i>ana</i>).....	1	<i>lis</i>).....	2
Pepperwort (<i>Marsilea vestita</i>).....	4	Unidentified grasses.....	5
Bur-reed (<i>Sparganium</i> sp.).....	3	Nut-grass (<i>Cyperus</i> sp.).....	3
Small pondweed (<i>Potamogeton pusil-</i>		Spike-rush (<i>Eleocharis</i> sp.).....	5
<i>lus</i>).....	2	Hair sedge (<i>Stenophyllus capillaris</i>)	1
Sago pondweed (<i>Potamogeton pecti-</i>		<i>Fimbristylis</i> sp.....	5
<i>natus</i>).....	2	Bulrush (<i>Scirpus</i> sp.).....	19
Pondweeds (<i>Potamogeton</i> sp.).....	13	Three-square (<i>Scirpus americanus</i>)	1
Bushy pondweed (<i>Najas flexilis</i>)...	3	River bulrush (<i>Scirpus fluviatilis</i>)..	1
Horned pondweed (<i>Zannichellia</i>		Bog-rush (<i>Mariscus mariscoides</i>)...	1
<i>palustris</i>).....	1	Saw-grass (<i>Mariscus jamaicensis</i>)..	6
Widgeon grass (<i>Ruppia maritima</i>)..	12	<i>Carex</i> sp.....	4
Wapato (<i>Sagittaria</i> sp.).....	1	<i>Carex decomposita</i>	1
Wild millet (<i>Echinochloa crus-galli</i>)	1	Unidentified sedges.....	11
Switch grass (<i>Panicum</i> sp.).....	6	Small duckweed (<i>Lemna minor</i>)....	1

Duckweed (<i>Lemna</i> sp.).....	2	Banana water-lily (<i>Castalia mexi-</i>	
False nettle (<i>Boehmeria cylindrica</i>)..	1	<i>cana</i>).....	2
Water smartweed (<i>Persicaria am-</i>		Waterlily (<i>Castalia</i> sp.).....	1
<i>phibia</i>).....	5	Senna (<i>Cassia</i> sp.).....	2
Prickly smartweed (<i>Tracaulon</i>		Poison ivy (<i>Rhus toxicodendron</i>)... 1.	
<i>sagittatum</i>).....	2	Grape (<i>Vitis</i> sp.).....	2
Unidentified smartweed (<i>Polygo-</i>		Malvaceae.....	1
<i>num</i> sp.).....	6	<i>Malva</i> sp.....	3
Pigweed (<i>Amaranthus</i> sp.).....	1	<i>Hypericum</i> sp.....	1
Lambs'-quarters (<i>Chenopodium</i> sp.)	1	Water milfoil (<i>Myriophyllum</i> sp.)..	3
Glasswort (<i>Salicornia ambigua</i>)....	1	Mermaid weed (<i>Proserpinaca</i> sp.)..	2
Sea purslane (<i>Sesuvium marti-</i>		Dodder (<i>Cuscuta</i> sp.).....	2
<i>num</i>).....	1	<i>Heliotropium indicum</i>	15
Coontail (<i>Ceratophyllum demersum</i>)	6	Cleavers (<i>Galium</i> sp.).....	1
Water-shield (<i>Brasenia schreberi</i>)..	3	Buttonbush (<i>Cephalanthus occi-</i>	
		<i>dentalis</i>).....	2

Notes from other authors.—Audubon¹ reports leeches as part of the food of the Shoveller; Aughey² found Rocky Mountain locusts (*Caloptenus spretus*) in a stomach he examined; Baker³ reports the mollusk (*Rissonia pulchra*); Fisher⁴ notes that: "At . . . Owens Lake, Calif., Mr. Nelson found it feeding extensively on the larvae and pupae of a small fly (*Ephydra hias*) which abounds in the lake," Lantz and Piper⁵ observed it feeding greedily on maggots as they floated downstream from a dead cow; and Samuels⁶ adds tadpoles to its bill of fare.

Summary.—So far as known, the Shoveller damages no crop, nor does it feed upon any animals of pronounced value to man. On the other hand it does devour various fish predators as dragon-fly nymphs, giant water-bugs, water scorpions, water-tigers, back-swimmers, and crawfishes. The latter creatures are destructive also to crops and leaves. The food preferences of the species are such that it probably is not attracted by pure clean stands of the valuable duck food plants so much as by sheer density of vegetation with an accompanying abundance of animal life.

¹ Orn. Biogr. 4, 1838, p. 241.

² Rep. U. S. Ent. Comm. 1877, app. 2, p. 59.

³ Proc. Ac. Sci. Phila., 1889, p. 267.

⁴ N. A. Fauna 7, 1893, p. 17.

⁵ Biol. Survey Field Notes.

⁶ Orn. & Col. New England, 1868, p. 497.

The food habits of the species are of interest in that a larger number of minute organisms such as ostracods, copepods and diatoms, are taken, than by most ducks, a result, no doubt, of more thorough sifting of the bottom ooze.

U. S. Biological Survey, Washington, D. C.

THE SONG OF THE FIELD SPARROW.

BY ARETAS A. SAUNDERS.

THE song of the Field Sparrow (*Spizella pusilla*) is one which can be studied comparatively easily. The abundance of the species in most parts of its breeding range; the length of the song period; the freedom with which the species sings, the individual repeating its song at short intervals; the clearness of quality, which makes the pitch of the notes easily determined; and the shortness and general simplicity of the song, all are factors which help to bring this about.

The more one studies bird song, the more one attempts to make accurate records of songs, the more he becomes impressed with the fact that in almost all species there is great individual variation. Such variation is the rule, not the exception. Because of this it is difficult to make definite general statements concerning the character of the song of any species. Any such statement must be qualified by the fact that there are often individuals that sing a song entirely different in one or more respects from all others of that species.

The general characteristics of the song of the Field Sparrow, covering the five main factors of variation in bird song, are as follows.

1. Time. The Field Sparrow song is of short duration. The average length of the song, based on the one hundred and forty-nine records I now have, is 2.7 seconds. The longest song of all is 4.6 seconds, and the shortest 1.6 seconds. It is rare to find songs that are longer than 3.2 seconds or shorter than 2.4 seconds. One specific time character, that holds in practically all songs, is

acceleration. The introductory notes are the longest and the terminal notes the shortest of the song, the latter often so rapidly repeated that they cannot be counted and must be recorded as a trill. It seems to me that the trilled notes of Field Sparrow songs are of this character, rather than a trill produced by the repetition of a consonant sound. (Auk, XXXII, p. 174.)

II. Pitch. The pitch of a single song of the Field Sparrow never varies greatly. The amount of variation may be none at all, or as much as four tones, but songs with a variation of more than two or two and a half tones are rare. The range of pitch for the species as shown by the same one hundred and forty-nine records is exactly one octave, from D^{'''} to D^{'''}. The great majority of songs range between C^{'''} and F^{'''}. The greatest range of any single song is four tones, from C^{'''} to E^{'''}. The variation in pitch of most songs grades evenly up or down the scale. Sudden changes in pitch of more than two tones are rare. The greatest changes in pitch are to be found in slurred notes at the beginning of certain songs.

III. Quality. The quality of the Field Sparrow song is that of a clear sweet whistle. There is no variation in quality noticeable in different parts of the same song, and very little between the songs of different individuals. It is the sweetness of quality that makes the song of this bird so pleasing. In other respects the song is quite simple, and does not show characters that would class the bird among the best singers. I have only one record of a song that varied enough from the usual sweetness of quality to make note of the fact. This song, number 23 in the illustrations, was distinct from others in other respects as well as quality. The voice of the bird was about the quality of that of the Redstart, and was not recognizable as that of a Field Sparrow at all. This song, which I shall mention again, is a good example of the occasional freak song that may occur in any species.

IV. Intensity. The general intensity of the song of the Field Sparrow varies but little. As a rule with most bird music, the higher notes carry farther than the lower ones. There are no markedly accented notes in the song, that is, not accented as far as intensity is concerned. Accent seems, by some writers on bird

song, to be treated as a time factor, that is, notes of longer duration are considered accented. From this standpoint many notes in the Field Sparrow song are accented. But I prefer to consider accent entirely a matter of intensity, an accented note being louder than others, not longer. From this standpoint accent is very slight or unknown in Field Sparrow songs.

I have measured the intensity of only one or two songs. Song number 9 in the illustrations was completely audible from a distance of three hundred and forty feet, on a day when the wind was not blowing. The highest part, the high part of the long trill, was audible from three hundred and eighty feet, under the same conditions. This was on a level, with few trees or other obstructions between my position and that of the bird. Figuring that the intensity of sound varies inversely as the square of the distance from its source, this would make the intensity of the lower notes of this song practically four-fifths of that of the higher notes. Another song, number 2 in the illustrations, was audible from about two hundred and eighty feet, but conditions for determining this were not so good in this case, so that the measure is less reliable.

V. Pronunciation. The song of this species is usually without consonant sounds of any sort. In fact I have not certainly heard such sounds in any song. Certain songs, such as number 10 in the illustrations, having notes with a slight upward slur in them, sound from a distance as tho these notes were not variable in pitch, but were introduced by a sound like the consonant *w*. That is, the slight slur makes the notes sound like "wee wee wee" instead of "eee eee eee," as they would sound if not slurred.

Having considered the general song of the species as a whole, the next point to consider is variation. Variation may be individual, local, or geographical. My records of the song of this species which are made by the graphic method¹ are all from southern New York and Connecticut, and do not show any geographical variation, and only slight local variation. While I have heard the song in other states I have made no records for definite comparison. I

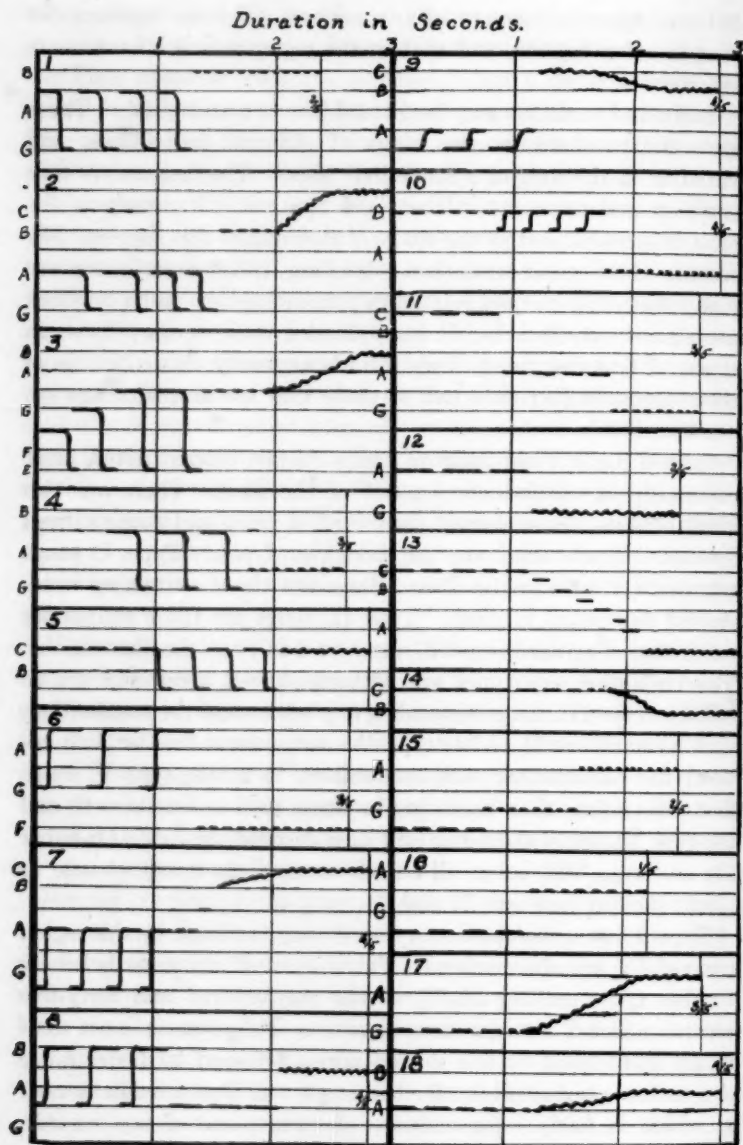
¹ 'Auk' XXXII, pp. 173 - 183.

have no notes or memory of any marked difference between the song in other regions, and that in the region where I have made my records.

Individual variation may be divided into two main kinds. These are variation between the songs of different individuals, and variation in the song of a single individual. The first sort is very common and apparent in the Field Sparrow. Its study is the most interesting part of the study of the song of this species. My records show great variation. Looking them over, there are many that show distinct relationship to each other, and a few that are almost exactly alike. I have divided these songs into seven types. I find that most of my records are easily classed in one of these types, in fact only two of those that are normal songs are not classifiable.

A good many Field Sparrow songs contain slurred notes, most commonly the introductory notes of the song. There are two kinds of slurs, those slurred downward in pitch and those slurred upward. These then are the first two types. Type I, songs numbered 1 to 5 in the illustrations, are those containing notes slurred downward in pitch. Type II, songs are those containing notes slurred upward in pitch, numbers 6 to 10 in the illustrations. The remaining five types are without slurred notes and are as follows: type III, songs descending in pitch toward the termination, such as numbers 11 to 14; type IV, songs ascending in pitch toward the termination, such as numbers 15 to 18; type V, songs first descending, then ascending in pitch, such as numbers 19 and 20; type VI, songs ascending and then descending, such as number 21; and type VII, songs all on one note, without any change in pitch, such as numbers 22 and 23.

Type I is the commonest type of song, at least in the region covered by my observations. Thirty-eight of my records belong to this type, making 26.2% of the one-hundred and forty-five records which I consider normal songs. This type is most commonly introduced by the slurred notes, followed by faster notes or a trill on a higher pitch. Such a song is well illustrated in number 1, which is fairly representative of twenty-one of my records. Song number 2 is distinctive in that the slurred notes are very



SONGS OF THE FIELD SPARROW.
TYPES I, II, III AND IV.

slow at first, and markedly accelerated as the song continues. I have three such records. Number 3 shows still a different variation, with the slurs ascending in pitch. I have three songs of this sort in my records. Number 4 is typical of four songs, introduced by a single long note, followed by the slurs. Number five is typical of four others where the slurred notes are in the middle of the song, instead of at the beginning. Three other songs of this type are essentially like number 1, but differ in that the termination is lower in pitch than the slurs, rather than higher.

Type II is also a common one, being represented in my records by thirty-one songs, or 21.4%. These songs are most commonly like numbers 6, 7 or 8 in form. Ten are like number 6 with the terminal portion lower in pitch than the introductory slurs. Six are like number 7, with the terminal trill higher. No less than thirteen are like number 8, the song divisible into three parts, first high pitched slurs, then low pitched single notes, then a terminal trill of medium pitch. This form of song is so distinctive that it might be classed as a separate type. It is commonly quite rhythmic in character and in the great majority of cases the first and second parts are of three notes each. Dr. Winsor M. Tyler has sent me descriptions of several Field Sparrow songs from Lexington, Mass. One of these is obviously this form of type II song. Song number 9 is distinct and without a second counterpart among my records. While it might be classed with number 7, its great distinction lies in the fact that the first note of the slur is the longer one, rather, than the second. Song number 10 is also the only one of its kind I have recorded, but Dr. Tyler has sent me a description of a similar one from Lexington. A third song he has sent me is also type II, but unlike any in my records. It begins with four slurs, the second, third and fourth each lower in pitch than the preceding one; and ends with a series of rapid notes on the same pitch as the first slur. In a way it is the opposite of a type I song, such as number 3.

Type III is nearly as common as type II. I have thirty records, making 20.7%. Number 11 represents a descending song broken into three distinct parts. I have three such songs. Number 12, broken into two distinct parts, is common and I have seven such

records. But the commonest of type III songs is represented in number 13, where the descent in pitch is gradual. I have fourteen such records. Number 14 is one with a change in pitch of only half a tone. I have six such records. They are interesting in that they grade toward the type VII song. In fact from a distance I have sometimes thought them type VII, and have always made a point not to record songs of such type unless I can hear them closely and distinctly. A recorder without a good musical ear would probably consider them type VII.

Type IV shows practically the same four variations as type III in exactly the reverse. I have twenty-six type IV songs, or 17.9%. Five are similar to number 15, seven to number 16, eleven to number 17, and three to number 18, a song with so slight a change in pitch that it shows intergradation between this type and type VII, and is easily mistaken for the latter. Song number 15 is in a way unusual. It is one of the most perfectly rhythmic Field Sparrow songs I have recorded, being in three parts exactly equal in time, according to the stop watch, and with four notes in the first part, eight in the second and twelve in the third.

Type V is rarer than the preceding types. I have only eight such songs making 5.5%. Five of these songs are similar to number 19 but the other three are rather irregular and more similar to number 20. The songs like number 19 show a strong relationship to type II songs such as number 8. In fact they are the same, save that the first notes are not slurred.

Type VI is a rare one. I rather hesitated about including it as a type, for the three songs I have are irregular and not much alike save in a general way. They are only 2.1% of the whole. Number 21 is an example, a unique song, but as representative as any of the type. The bird that sang this song occasionally dropped off the terminal trill, leaving nothing but a simple type IV song, so that possibly the evolution of such a song was from type IV.

Type VII is represented by seven records or 4.8%. I also have one record of this type from Mr. Tyler. Six of my seven records are like number 22, differing from each other only in pitch and in length. The seventh, number 23, is unique in two respects,

and to be regarded as a freak song. It shows none of the acceleration, which seems to be a general characteristic of Field Sparrow songs, and, as I have already mentioned, its quality was not that of the usual Field Sparrow song, so that when I first heard it I thought it some warbler with which I was not familiar, and was much surprised when I identified it. This bird was found in Norwalk in May 1917, and again in the same place in May 1918, but in 1919 it was not found.

Unusual songs, not belonging to any type, are represented in numbers 24 and 25. These are the only normal songs I have that are not classifiable in one of the seven types. Dr. Tyler, who has described only songs that seemed to him unusual, describes one beginning with four notes alternating on two different pitches followed by a descending trill. In general it is like a type III song, but differs enough at the beginning to be not classifiable. My own records that do not belong to any type are 1.4% of my normal records.

The next point to consider is variation within the individual. This variation consists of three kinds. First, slight variation of a single song; second, possession of two or more distinct normal songs; third, certain peculiar seasonal variations that are evidently abnormal. The first of these is a common form of variation, though apparently not found in all individuals. It may be often observed by watching and listening to a single bird for a short period of time. The bird may vary its song by changing the number of introductory notes or slurs, by slightly varying the pitch of the terminal notes, by cutting the length of the terminal trill short, or in type I and II songs by substituting one or more single notes for slurs. Thus I have recorded from a single bird in the course of half an hour seven songs that were all slightly different, yet all of the same type and same general characteristics. Some individuals, however, never show any such variation, but sing their song over and over exactly the same. This was true of the bird singing the distinctive song, number 9. The bird was observed singing in the same place on many different days for more than a month, but there was never the slightest change in the song in form, pitch or time.

The second sort of variation, the possession of two or more

distinct songs by a single individual, seems to be a rare phenomenon in the Field Sparrow. I have only one case on record, that of a single bird that I observed in the same place several different days singing first a type I song, than after a short time changing to a type II. The type I song was distinctly lower in pitch than the type II. Once the bird sang the two songs consecutively, without a pause between them, first the type II song, followed immediately by the type I. In the spring and summer of 1920, I had some forty different individual Field Sparrows under more or less constant observation from day to day. Yet this was the only case where a bird was found to possess two different types of song, a strong contrast to the Song Sparrow, each normal individual of which has several different songs. I have one case on record of a Song Sparrow with twenty-four totally different songs. Such variation is so obvious in that species, that it seems as if more of it would show in the Field Sparrow if possessed in any marked degree.

The last kind of individual variation is a peculiar sort that seems to be common to a number of different species of birds. As late summer approaches and the period of song draws near its close, with the approach of the postnuptial moult, birds begin to vary their songs in many peculiar ways. The songs numbered 26, 27, 28, and 31 are examples of peculiarities of this sort. At this time all general rules for the song of the species seem to be broken, and in Field Sparrows, songs are decidedly irregular in both pitch and time characters, though they are usually of the same sweet quality as before. Intensity is also sometimes varied, and the songs become soft and inaudible from any great distance. For this sort of variation I propose the term postnuptial variation, because it comes with the approach of the postnuptial moult, at the season when nesting duties are completed.

One might suspect that these peculiar songs are those of young birds of the year, just learning to sing. In order to be sure of this point I have carefully examined several birds singing such songs, and always found them adults without any sign of the streaked breast which young would have at this time. When one considers the physiological cause of bird song, it would seem

impossible that any young bird would sing in the year it is born, or, at any rate, before the post-juvenal molt.

The examples of postnuptial variation I have given are the only ones I have on record, though I have often heard others. They are heard less frequently than normal songs and are therefore less easily recorded. Number 26 is believed to be from the same bird that sang song number 8 as its normal one. It was in the same locality, and there are similarities in pitch and arrangement of the two songs, tho not so much so in time. Numbers 27 and 28 are two from another bird, and a bird who normally sang a type I song very similar to song number 1. The bird was heard singing the normal song, and both these variations, together with some others I was unable to record, on July 25, 1920, about a week before the song period of this species began to show signs of diminishing. Number 31 is a song from a bird I could not identify with any whose normal songs were on record, though I should suspect that its normal song was type II. It is the longest Field Sparrow song I have on record.

The Song period of the Field Sparrow, in Connecticut at least, begins with the arrival of the birds in spring, about the first of April, and lasts till August. The average date of first song heard in eleven years' records is March 26. The earliest date is March 12, 1921. This date and two others, March 14, 1902, and March 13, 1915, are probably those of birds that had wintered in the vicinity. The latest date for the beginning of song is April 16, 1916, a year in which the species arrived April 2, but was not heard singing till later. Dates when the song period ceases are more difficult to obtain. Summers have frequently been spent in other localities, out of the range of the Field Sparrow, and in early years no summer records were kept. The average date of the last song heard in five years' observations is August 18, the earliest being August 7, 1920, and the latest August 26, 1918. One still later date, that I did not average in with others because from a different locality, is September 2, 1907, at Milford, Pike County, Pennsylvania.

There is no regular period of song in the fall for this species. Whether occasional birds sing at this season I am not sure. Trust-

ing memory I should say that I had heard the song in the fall, but my notes covering ten years in which I was in the range of this species at this season, do not mention a single instance. During these years I kept daily records of birds heard singing. I have frequent notes on the fall singing of many other species, so I feel justified in stating that fall singing on the part of the Field Sparrow is a rare occurrence.

While these notes pertain to the song period of the species, the period for the individual is quite another matter. Those who have tried going out in the height of the migration in May, to see how many species could be recorded in a single day, have probably noted that few Field Sparrows are in song at that season, though they were singing abundantly a week or so before. I have noted this fact for a number of years, and sometimes found it difficult to find Field Sparrows in the third week in May, simply because so few of them were singing. But it was not until this year that I realized that many individual Field Sparrows are silent for much longer periods than a week, even right in the midst of the song period.

My notes are insufficient at the present time to report as fully as I should like upon this phenomenon. In general, the facts seem to be, that the majority of birds cease singing about the middle of May, and that a good many individuals do not resume again for a month or more. When they do, it may be to sing for only a few days when they cease again for the remainder of the season, or it may be to sing regularly from then until August. I can only guess at the cause of these phenomena. I believe that a successfully mated male bird ceases to sing as soon as incubation of the eggs begins, and that he does not sing again until the young have left the nest, and it is time to start a second brood. The few birds singing in mid-May are then, either birds that are unmated, or birds that have not started to nest at the normal time for the species. Those that resume singing in late May are those whose nests were broken up for some reason. The resumption of song in late June comes when the first brood is out of the nest and the second brood is beginning. Those birds who do not mate successfully for a second brood continue singing for the rest of

the song period. If these are the facts, it is a strong proof that song, in this species, not only originated by sexual selection, but is still mainly useful to obtain a mate. I hope for the opportunity to continue study on this problem, and to be able to make more positive statements later.

One more fact remains to be mentioned concerning the song of this species, a fact that produces some difficulty in tracing individuals, but is otherwise of considerable interest. It is not uncommon to find birds that are near neighbors singing exactly or approximately the same song. I have never found more than two such birds in a locality but it is possible that three or more may occur. I first noticed this fact at West Haven in 1915, when two birds, with a type III song similar to number 13 in the illustrations, sang the song exactly alike as clearly as my ear could distinguish. The birds alternated with each other from points about seventy-five yards apart. I have since found two other cases of type III songs that were alike, and one of type IV. Other types are not so simple and seem less likely to be exactly alike. I have found both type I and II songs sung by two birds in hearing of each other, the songs similar, but not quite alike. In one locality were two type I singers with songs both showing the peculiarities of number 2 in the illustrations, the songs only slightly different from each other. In another case two birds sang type II songs similar to number 8. Numbers 29 and 30 in the illustrations are introduced to show another case of this sort. The resemblance between these songs was more marked than the records show, for while the number 29 song was usually as it is recorded, the bird occasionally, varied it by dropping the final trill to G, exactly as number 30 sang it. These observations show that it is not always possible to be sure of an individual because of the peculiarities of its song alone, but careful observation throughout the season will generally show whether there are in the same locality, two or more individuals having the same type of song.

This phenomenon may be considered support for the theory that individual birds learn to sing by imitating other individuals. If young birds learn to sing from listening to parents, then two birds singing similar songs may be related by blood, either parent

and offspring or both offspring of the same male parent. Possibly they are not related, but sing alike because the younger bird learned its song from the older, or both learned to sing from the same individual.

48 Longview Ave., Fairfield, Conn.

THE BREEDING HABITS OF THE NORTHERN RAVEN IN PENNSYLVANIA

BY RICHARD C. HARLOW.

BORDERING on extinction as a Pennsylvania bird, a few widely scattered pairs of Northern Ravens still exist in the mountains of Snyder, Mifflin, Center, Blair, Clinton, Union, Juniata, Lycoming and Huntingdon Counties (definite breeding records.) It is highly probable that a few still linger in the wildest sections of Luzerne, Columbia, Montour, Northumberland, Wyoming, Sullivan, Bedford and Fulton Counties. I have obtained reliable information of the breeding of these birds in Wyoming and Sullivan Counties during the last ten years and have seen birds taken there, while on April 18, 1919, I saw an adult bird with food in its beak and closely pursued by Crows in Luzerne County. It is probable that there are more pairs left in Center County than elsewhere within the state with Huntingdon, Mifflin and Clinton Counties following closely.

As late as 1900 it was still a fairly common breeding bird in many of the counties named but the decrease during the last ten years has been very marked and unless rigid steps are taken for its preservation, it will be but a very few years before it follows the Wild Pigeon into the list of extinct Pennsylvania species.

The Raven is naturally a very shy species and will not stand the encroachment of civilization and in a number of instances I have known them to leave nests which had been used for generations, as soon as heavy lumbering took place in close proximity to them. In 1917 out of five previously used nests, only one

pair was present. In my investigations throughout the central Pennsylvania mountains, I have located no less than sixteen nesting places, all of which had been used for years but all of which had been totally deserted from two to five years before being located. All of these were absolutely authentic records as in each case the bulky nests were still present on the cliffs.

The number of birds shot can not be the most serious factor in their decrease though it undoubtedly must be considered. Neither can the collecting of their eggs. The writer has taken a number of sets in his studies but never save in the case of one pair in 1910 and 1911 has a second set been taken in the same year. In nearly every instance a second set of eggs was deposited within three weeks and the same number of eggs laid as the first nest contained. As but one brood is raised it can readily be seen that no decrease can be attributed to this factor. The main reason for their decrease is lumbering in the vicinity of their nests or the encroachment of civilization in the shape of too-frequently used roads, or houses being built too close to the cliffs they occupy. In nearly every case these conditions are followed by the disappearance of the birds.

Food. During the winter and early spring the Raven is largely omnivorous. I have known them to eat the buds of various trees when hard pressed for food. At this season, however, they feed largely upon refuse picked up about the various deer camps which are so numerous throughout this territory. Bits of fat, flesh adhering to old bones and skin and legs of deer, all of which are commonly left in the vicinity of these camps are greedily sought out. Corn fields on the edge of their mountain fastnesses are visited and any corn that may have been left, devoured. Any dead animal is a feast and I have observed five Ravens feeding on the carcass of a dead dog in the snow.

A fact that I do not believe is generally known is that these birds disgorge pellets after the custom of our Owls.¹ I have repeatedly picked up these pellets on their nesting and roosting ledges and found them during the spring to contain the indigestible

¹ See Hoffman, Auk 1920, p. 454. [Ed.]

portions of various species of insects (chiefly Coleoptera) with bones and fur of smaller rodents in several instances. In several nests I have climbed to when they held young birds, I have found remains of frogs and small garter snakes. In no instances have I noted the Raven destroying birds' nests or eggs in the manner of the Crow and the Grackle and as the bird will always be one of our rarest species there is every reason to urge that it be taken off the list of unprotected species in the state.

I am fully aware that there is a great divergence of opinion concerning the question as to whether birds remain mated for life. Nevertheless in the case of the Raven I am firmly convinced that such is the case. In the case of the male bird especially the species is one of striking individuality. One male of a pair which I have studied for four years is very fearless, very noisy and possesses a deep voice which may easily be distinguished from that of any other Raven. Another male of a pair I have visited four times is invariably silent, soaring once and then leaving the cliff entirely, never varying this procedure from year to year. Still another whose home I have visited three times always utters a note (in addition to the usual vocabulary) that is strikingly like a hoarse laugh "haw-haw-haw-haw." Then there is the striking individuality in nesting of certain pairs. One pair builds always in trees, several times nesting within a hundred yards of one of the finest and most typical cliffs I know. Another pair always uses a cliff surrounded by a splendid forest containing numerous tree sites. One thing is sure, in so far as my experience goes, a pair which one discovers nesting in a tree will always be found thereafter in trees and a pair which once chooses a cliff always remains true to their first choice. Other characteristics are evident also to prove the same birds present at the same nests years after year. One male always comes to meet me when I am yet a quarter of a mile away, taking the same course each year, another always warns the female with a low note and sneaks away over the back of the ridge. Females, likewise, possess the same striking individuality of voice and action as the males. Then in addition to the choice of nest sites as evidenced above, different females lay very distinct types of eggs which, as a rule run very true. One nest al-

ways contains very dark uniform eggs while another holds very lightly marked specimens with a pale bluish-green background. The first nest of the two just mentioned runs to very small eggs, scarcely larger than Crow's, while the second nest always holds large sized eggs. The number in the set does not hold as true, though certain pairs never lay over four eggs and commonly three while others run to four and five. However, this is a problem which seems to be largely controlled by the vitality of the female at the time of reproduction, i. e.—dependent upon her age and the abundance of food during the winter months.

COURTSHIP. Mating takes place during the first ten days in February. A bird occasionally roosts upon one of the old nesting ledges during the winter as is evident by excrement found there but this is by no means usual. The pair return to the cliff together usually the first week in February, at first only for a short visit each day, and later for several visits. A heavy storm at this time usually delays these visits for several days. At this time I have seen them go to the nesting ledge, the female usually alighting on the ledge and the male on a dead stub nearby and spend ten or fifteen minutes there. At this time they often soar together high up in the air with wing tips touching, the male always slightly above the female. At times he will give a wonderful display of his prowess on the wing, either dropping like a meteor for several hundred feet and fairly hissing through the air in the manner of the male Duck Hawk, or tumbling like a pigeon over and over. During this period also, I have found them perched close together high up in an old dead tree caressing each other with bills touching.

VOICE. At this time and during incubation they seem to have a more extended vocabulary than during the rest of the year. As I have already said the Raven shows great individuality in its notes while the voice of the male is much deeper and stronger than that of the female. During the period of courtship and incubation there are two distinct notes that I have not heard at any other time. One is a soft "crawk," which the male gives to the female when he is sitting near her while she is on the nest ledge or incubating. The other is a series of "crawks" given while

on the wing and with rarely a note best expressed by the syllables "ge-lick-ge-lee" given either between the "crawks" or still more rarely as a single note.

This note which I have never seen described has a metallic gurgle which does not carry very far. Then there is of course the usual "crruck" given either singly or repeated any number of times but very frequently repeated three times when the bird is alarmed. There is also a "crruak" given by the male and often repeated four times as a form of song when undisturbed and near the nest, though it may be given singly. These last two notes are given either upon the wing or while perched. The usual wing note is the rolling guttural "crruck." As I have said before, nearly every Raven I have met has some note that is distinctive but the above are the usual types. I have also heard a very distinct hollow, sepulchral laugh "haw-haw-haw-haw." The note of the young is easily distinguished up to the age of at least six months as I have raised the young from the nest up until this time. It is a harsh "cawr" when in the nest, more like the note of a Crow than of a Raven. The young are very noisy and from sad experience in my home I can testify that their desire for food is insatiable and backed up by strong lungs from dawn till dark.

NESTING SITE. There are two distinct types of nesting site chosen here in Pennsylvania—the cliff site and the tree site (the cliff nests outnumbering the tree nests in the proportion of about eight to one. This may be more accentuated because of the present lack of large timber, but the fact remains that according to tradition of the oldest settlers in the vicinity of the nests, some of the cliff sites have been used for seventy years, long before the former great white pine forests were cleared.

One feature is almost invariably demanded by the cliff nesting Ravens and that is that the location be dark and well shaded. Usually the darkest available section of the cliff is selected where the ledges are shaded by hemlocks which often grow on the smallest ledge on the face of the cliff. Very frequently the nest will be placed under an overhanging tongue of rock so that it will be protected from above and I have yet to see a nest in use that is not sheltered either by trees or by an overhang. Their need for

this is made evident when it is realized that nest building is begun and egg laying often started in February, while these mountains are subject to some of their worst winter storms and I have seen the ledges covered with snow and ice as late as March 20. A nest examined on March 16, 1919, was completely draped by icicles frozen from the overhang above to the rim of the nest on three sides. The next year the birds moved to a pot hole where they were more safe. Probably eighty per cent of the cliff nests found have been in mountain gaps and passes on the west side of the gaps, probably because the best shaded cliffs occur on that side though in certain sections where the rock strata lie parallel with the ridge, they breed along the ridge at any well shaded point. The height of the cliff seems to be a secondary consideration to the shade, though rarely is a cliff with a straight drop of less than fifty feet chosen and they run from there up to two hundred feet. The nest is built either on a projecting shelf or ledge either large or small, where suitable protection is offered with distance from the ground a secondary consideration but usually on the ledge most difficult of access. I have found nests in a pot hole only eight feet down on a two hundred foot cliff and again only sixteen feet up from the bottom of a fifty foot ledge. The nesting ledge almost invariably is well up towards the top of the mountain, often on a cliff near the summit, so the birds have a clear outlook of the surrounding country for miles. In such a case the cliff may not be as high but there will be an almost perpendicular talus slope at the base of the cliff running almost to the foot of the mountain. I have never seen a nest on a ledge that had any vegetation on it.

In the case of the tree nesting Ravens, the first requisite they seem to demand is the highest available tree and the second is good cover in the very top of the tree. The tree nests are giant structures over four feet across and yet the birds conceal them so well in the very top of the tree that they are frequently very hard to see from the ground. Usually the wildest mountain swamp is chosen where there still remain some large white pines and hemlocks. I have never known of a tree nest of the Raven to be used two years in succession even though absolutely undisturbed and when young were reared in safety. The birds usually return

to the same swamp but the nest site may be shifted from a hundred yards to a mile or more. One pair brought out four young one year undisturbed and the next year shifted five miles out of the swamp into a heavily timbered gap but returned the following year into the original swamp. I feel sure this is more often the case than is usually supposed for I have known of other cases where birds have been absent from a swamp for a year or more and have later returned.

In the case of cliff nesting Ravens, the birds usually return to the same ledge, though some pairs are much more persistent than others in this respect. Others will return to the same cliff, but vary in the ledge chosen, sometimes nesting on one ledge for several years and then shifting to another. I am strongly convinced that some of these birds (possibly very old ones) do not breed every year. At least in a number of cases I have found the nest completed and both birds present through the breeding season and yet no eggs were laid though the birds exhibited every solicitude at the presence of intruders. In other cases I have known of nests being rebuilt each year and yet only one bird was present. It is possible that the nest in such instances may have been a blind but I cannot feel such was the case where visit after visit would have revealed both birds. A very striking example is given in the case of a pair of birds nesting only a few miles from my home at State College, Pa. Young birds were taken from this pair in 1909 and sets of eggs in 1910 and 1911. From 1911 to 1919 this nest was rebuilt each year and both birds were frequently found about it, but in all this stretch of time no eggs were laid in the nest. It is my theory that the female had become so old that she was infertile as Ravens had nested on this cliff for sixty years according to the oldest settlers. In the summer of 1918, the female was shot by a hunter and the following spring the male returned with a new mate, the old nest was rebuilt and three eggs were laid.

The Raven is essentially a solitary bird and the nests of different pairs are usually a considerable distance apart. The only pairs I know of which nest at all near to one another are six miles apart. I know of no bird which comes into direct contact with the Raven

during the breeding season but the Duck Hawk and as this species stands civilization better through nesting on higher cliffs than the average Raven it usually outlasts the latter. There seems to be a mutual respect between the two species and though they have occasional disagreements I have known them to nest on ledges only forty feet apart, the Raven having young while the Duck Hawk had eggs. Certainly there is no other bird which would brave the Duck Hawk's wrath.

Nest building varies much more according to the individuality of the pair than to the severity of the season. I have gathered together very carefully data for the three last seasons which should serve to exemplify pretty well all types of seasonal conditions found in central Pennsylvania. The season of 1919 could be called fairly normal. During 1920 deep snow lay in the mountains till April 1, while 1921 presented one of the earliest seasons in history. Nest building for the six pairs studied began as follows:

	1919	1920	1921
Pair A.....	Feb. 16	Feb. 20	March 1
Pair B.....	Feb. 17		Feb. 14
Pair C.....	Feb. 17	March 10	
Pair D.....	Feb. 7	Feb. 18	Feb. 14.
Pair E.....	Feb. 7	Feb. 15	Feb. 10
Pair F.....	March 1	Feb. 20	Feb. 20

When the above are averaged with all other data, it is evident that under normal conditions, nest building begins between February 7 and 15, though some individuals may postpone it much later. It may also be readily seen that in the case of this bird seasonal conditions influence it but little. Nest building is done almost entirely by the female. I have seen the male a few times carrying sticks but in each instance they were dropped on the ground near the ledge. On March 2, 1919, I watched a pair building for sometime. The female made four trips at intervals of from ten minutes to half an hour, carrying each time a beak full of deer hair which she placed in the nest as lining. The male constantly accompanied her flying close to her on all the trips and occasionally giving exhibitions of his aerial prowess for her benefit—once dropping over and over at least sixty feet in the air like a tumbler pigeon. Both birds croaked frequently in the vicinity of the nest, the female

in spite of the fact that her beak was apparently full of hair. The male always perched on a dead stub close to the nest while she worked the lining into the cup. One pair I have watched are usually silent in building but most pairs call to each other in the vicinity of the nest.

Nest building occupies a period of between fourteen and eighteen days. The nest is a huge yet neat structure always conforming in contour with the ledge or crotch on which it is placed. For instance, one pair built in 1919 on a very small ledge and the nest was quite small but in 1920 shifted into a large crack or pot hole, and the nest was a huge structure over four feet across. It is well built into the ledge, pot hole or crotch in which it is placed, sticks being wedged into all available cracks near the base of the nest. The tree nests are usually placed in a double or triple vertical crotch from seventy to over one hundred feet up,—nearly always the highest available strong crotch but in one instance a horizontal crotch four feet out on a large limb was used.

The base of the nest varies from little more than three feet to five feet in the largest nests with an average of almost four feet. The cavity averages a foot in diameter and six inches in depth, the depth varying considerably. In several nests, I have seen one side of the cavity was against the face of the cliff or an upright limb, far from the center of the base and with practically no rim on one side. Usually, however, it is a fairly symmetrical nest for so large a structure. The base is composed almost entirely of dead branches and sticks, freshly broken by the birds themselves. When built upon last year's nest, the freshly broken sticks make a sharp line of contrast where they are built upon the old excrement bespattered rim of the previous year. Some of these dead branches are over three quarters of an inch in diameter and over three feet long. Oak sticks seem to be most frequently used though hemlock, pine and chestnut often occur as well. Frequently freshly broken and budded twigs (usually birch) bruised by the beaks of the birds are found especially well up toward the rim. This was a constant feature of all nests found in 1920, probably because the deep snows covered nearly all piles of brush and dead fallen trees. A great number of dead sticks always fall to the ground

or are blown out in the building and the snow underneath the ledge or tree is covered with them.

The two most constant features of the cup lining are bark shreds and deer hair, the latter predominating when available. When using the old nest the birds tear out the top lining from the previous year which has been fouled by the young and throw it out of the nest so that nearly always one may find small tufts of deer hair on the ground nearby. The bark strips, shreds and fibres are obtained from dead trees, underneath the rough outer bark and they frequently use grape vines shreds as well. Some nests are lined almost entirely with white hair from the belly of the deer and some with red from the back, the birds using just what is available from the carcass. Outside of these main features the lining varies according to material available in the various localities. Tufts of hair from domestic cattle or from dogs as well as horse hair are frequently found. Bits of fur from the skunk, opossum and wild cat, sheep wool, bits of green moss scraped from the sides of rocks are all used by various pairs. I have found one nest heavily felted with material which the birds had been seen picking from an old felt hat and in another lining were bits of rope. Perhaps the most striking nest was one containing a heavy lining of deer hair and flourishing on one side of the cavity was the entire tail of a deer.

A period of several days intervenes between the completion of the nest and the laying of the first egg. This varies with different pairs between three days and a week. During this time the birds visit the nest together at intervals during the day, the female going on the nest and turning around much as a bird does when she is moulding the cup into the right form.

I am appending a table of the pairs previously tabulated to show the dates of the laying of the first egg for the three years noted under nest building:

	1919	1920	1921
	normal	very late	very early
Pair A.....	March 4	March 2	
Pair B.....	March 5		March 1
Pair C.....	March 5	April 5	
Pair D.....	Feb. 22	March 5	March 3
Pair E.....	Feb. 25	March 2	March 2.
Pair F.....	March 17	March 15	March 10.

Despite previously published surmises, egg deposition occurs *daily* until the set is complete. In severe weather the female remains on the nest from the time the first egg is laid, leaving only for short trips for food. Under ordinary conditions however, she covers the eggs only at night until the full number is laid.

The eggs vary in number from two to seven with the average set consisting of four or five. Sets of three are quite common and certain pairs never lay more than three or four eggs. Six is very rare while I have but one record each of sets of seven and two.

The eggs vary a great deal both in size and coloration, some being so small as to approach the largest type of eggs of the Crow. The ground color is a pale bluish green or light olive green, spotted, dashed, blotched, streaked or smeared with greenish brown, dark brown and sometimes fewer markings of purplish and black. Some types are so heavily marked that the ground color is almost obscured and the color is uniform owing to the density of the markings. Other eggs are streaked and scrawled lightly, resembling very greatly the common type of egg of the White-necked Raven.

The average size of eggs of the Northern Raven taken in Pennsylvania will run considerably smaller than that of eggs taken farther north. A series of nineteen eggs averages in millimeters 48.4 mm. by 32.5 mm with extremes of 51 mm. and 44.8 mm. in length and 34 mm. and 31 mm. in width.

The four sets (nineteen eggs) measure in millimeters as follows:

Set A.	Set B.	Set C.	Set D.
44.8 × 33	50 × 33	48.6 × 33	49.2 × 34
47 × 31	49 × 32.6	49.4 × 32.6	49 × 34
47 × 32	47 × 31.5	48 × 31	50 × 34
46 × 31.1	51 × 32.5	50 × 32.6	49 × 33
		50 × 31.1	51 × 32.6
			51.6 × 34.2

The period of incubation is twenty days. During this time the male feeds the female upon the nest but does not as a rule sit upon the eggs except in cold, stormy weather when the female leaves the nest for food.

As in the case of nearly all species I have studied where the female is fed on the nest, she leaves it two or three times

daily for exercise and short searches for food. Except when hunting for food, the male is usually found during incubation perched on some dead stub not far from the nest. In such cases he croaks a warning to the sitting female on the approach of an intruder and she often leaves the nest when a person is yet two hundred and fifty yards away. In some pairs, and especially if the male is not on guard, the female sits until one is within fifty yards of the nest but such cases can not be considered as typical. Tree nesting birds usually leave the nest as the tree is approached. Both birds usually soar well up in the air croaking while the nest is being inspected but where a prolonged stay is made in the vicinity of the nest they will frequently perch side by side on a dead tree well away from the nest or leave the vicinity entirely for half an hour or more. The male is much more fearless and demonstrative in his defense of the nest, if defense it may be called.

The young are fed by both birds and remain in the nest for a period of four weeks and when they finally leave can fly short distances fairly well. They are very noisy when food is brought. The rim of the nest and the surrounding rock or limbs are heavily bespattered with white, chalky excrement, the young turning up their tails to the edge of the nest and evacuating over it. In fact I have seen some cliff nests where the cliff was as heavily spattered as a Duck Hawk ledge.

The parents are quite fearless in defense of their home against other birds. Usually they pay no attention to the pestering of Crows but about the nest I have seen them several times pick out individual Crows from the harrassing flocks and drive them clear out of the valley, striking heavily with their beaks while the Crows squawked with fear. They easily drive off the Red-tailed and Broad-winged Hawks and these birds put up but a feeble defense when beset.

The young stay about the vicinity of the nest for a week or more after leaving it but soon scatter and one rarely sees the family parties so common in many closely related species. I have seen but one instance of flocking on January 7, 1917, when a flock of seventeen were counted in a wild mountain section—probably influenced by food conditions.

State College, Pa.

GENERAL NOTES

The Iceland Gull (*Larus leucopterus*) in California.—A flying field trip into Kern County, California, made by Dr. Loye Miller and the junior author in the closing days of the past year not only furnished an opportunity for personal observation of the important Pleistocene deposits recently discovered in the McKittrick region, but also yielded one interesting record of range extension for a modern species. On December 30, 1921, Dr. Miller picked up a dead gull on one of the levees on the west side of Buena Vista Lake. The bird had evidently been killed by some duck hunter an hour or two before, and aside from semi-decapitation at the hands of the same "sportsman", was in perfect condition.

The specimen differed so radically from any *Larus glaucescens* available in southern California collections that it was sent to Dr. Jonathan Dwight for determination. He pronounces it *Larus leucopterus*, and as such it constitutes a new record for this State. The specific data relative to the capture is as follows: Female, immature of the first winter; No. J 1824, Collection of Donald R. Dickey; Buena Vista Lake, Kern County, California; December 30, 1921; collected by Loye Miller and A. J. van Rossem.—D. R. DICKEY and A. J. VAN ROSSEM, Pasadena, California.

Pelicans in the Interior of Alabama.—During the past season, several newspaper notes detailing the killing of both the White and Brown Pelican, in the interior of the State, have appeared. In October 1921, a hunter killed a large White Pelican (*Pelecanus erythrorhynchos*) at Mountain Creek, in Chilton County, more than 200 miles, in an airline, north of the coast. The bird stopped to rest at a small pond, and was killed and brought to this department and mounted for our collection. It measures nearly nine feet in extent.

During the first few days in February the newspapers carried accounts of the shooting of both species more than 100 miles from the coast. A White Pelican was killed at Selma, Dallas County, and Brown Pelicans (*P. occidentalis*) in Escambia and Butler Counties, and in Montgomery. The bird taken at Georgiana, in Escambia County, is without toe nails on the right foot. It appears to be of great age. The one taken at Montgomery struck a telephone wire during a day flight, killing itself in the streets of the city. The two specimens just referred to are both mounted and in our collection, and measure more than eight feet in expanse.—PETER A. BRANNON, Alabama State Department of Archives and History, Montgomery, Alabama.

Eider Duck—A Correction.—Under date of April 1890, Vol. VII, No. 2, of 'The Auk,' a note appears stating that a specimen of the Common Eider Duck (*Somateria dresseri*) had been shot near Ottawa. This I regret

to state was incorrect, as the specimen has proven to be a young King Eider (*S. spectabilis*). Through the kindness of Mr. P. A. Taverner, Zoologist of the Geological Survey Department, and Mr. Hoyes Lloyd, Ornithologist of the Dominion Parks Branch, Department of the Interior, who recently placed at my disposal a very large number of specimens of both King and Common Eider, the bird has been positively identified as a young King Eider, in the plumage of the female.—GEORGE R. WHITE, *Ottawa, Canada*.

Anas diazi novimexicana and Grus americana in Nebraska.—Last November while on a shooting trip in Cherry County, Nebraska, I obtained a duck which appeared strange to me. The specimen was saved and has been identified by Dr. H. C. Oberholser as *Anas diazi novimexicana* (Huber). The bird, a female, was shot October 17, 1921, on Dad's Lake, Cherry County, Nebraska, by Colonel Dale Bumstead and is now in my collection. As this is believed to be the first known occurrence of this bird outside of New Mexico, it seems worthy of note.

While on this same trip I heard of a supposed occurrence of the Whooping Crane. The gentleman from whom the information was obtained was a member of the Red Deer Lake Shooting Club, and stated that on October 14, 1921, two Whooping Cranes had alighted on the shores of Red Deer Lake and that one had been killed by a farmer boy in the vicinity. I did not see this bird myself, but believe the report to be authentic.—H. B. CONOVER, *Chicago, Ill.*

Whooping Cranes (*Grus americana*) in Texas.—On December 23, 1921, it was my good fortune to find four individuals of this rare species in southern Texas. At the time I was in company with Richard M. Kleberg, in charge of the Laureles Ranch, a sub-division of the great King Ranch.

Perhaps twenty-five miles almost directly South of Corpus Christi there is, except in abnormal seasons, a large shallow lake known as Laguna Larga. It was here that the Cranes were seen. The past winter was an unusually dry season in Texas and the water in the Laguna Larga was very low. On the prairies formerly constituting the lake bottom there were a large number of geese, particularly Snow Goose (*Chen hyperboreus hyperboreus*), and the Hutchins' Goose (*Branta canadensis hutchinsi*). One Blue Goose (*Chen caerulescens*) was identified.

While riding over this territory with Mr. Kleberg, he pointed out at a distance two Whooping Cranes feeding on the prairie. They were probably a quarter of a mile away at the time. On nearer approach they rose and alighted after flying a short distance. There was no possibility of doubt as to the identification. Perhaps five miles farther south two others were discovered. On approaching these we encountered some

marshy ground and the car was stopped at a distance from the birds which we estimated as 300 yards. After watching them for a time through the field glasses Mr. Kleberg fired a shot and the birds both rose. He told me that Whooping Cranes have been coming to Laguna Larga every winter for sixteen years, and that eight is the largest number he has ever known to be there at one time. The same general statement was borne out by other local people who are acquainted with the section.

In this connection I might add that I have recently received from Miss E. Margaret Estlin of Victoria, B. C., a statement to the effect that she saw two Whooping Cranes in northern Saskatchewan in the autumn of 1921. She also forwarded photographs of a living immature Whooping Crane which she states she made in the same general neighborhood "a few years ago."—T. GILBERT PEARSON, *New York*.

Florida caerulea in Saratoga County, N. Y.—On April 13, 1922, a Little Blue Heron (blue phase) adult was seen feeding along the abandoned Champlain Canal one mile north of Waterford, N. Y. Waterford is in the south-east corner of Saratoga County, at the junction of the Mohawk and Hudson Rivers, 160 miles north of New York City. A two day period of very warm weather terminated April 11 with intense thunderstorms and gales.

The bird was very tame and allowed me to approach within forty feet, once at 11.30 A. M. and again at 2 P. M. Each time it was in fine light, even the plumes on head and upper tail coverts showing distinctly. The color, size, length of neck, manner of flight (as a Great Blue Heron), etc., identifying it beyond question as I am very familiar with this heron in the Florida Everglades.

Mr. S. C. Bishop, N. Y. State Zoologist, and Mr. H. P. Chrisp of Albany came to see it the next day but the bird had disappeared.—EDGAR BEDELL, *Waterford, N. Y.*

Greater Yellow-legs Records at Elizabeth, N. J.—In response to the request of Mr. J. T. Nichols in February, 1922, 'Bird Lore,' for details concerning my statement in October, 1922, 'Auk' that at least two Greater Yellow-legs (*Totanus melanoleucus*) remained here throughout the 1921 breeding season, I submit the following: The Greater Yellow-legs, according to intermittent observations by the writer during the past twenty-five years, is normally absent from the local salt marshes from June 15 to July 15. Between these dates in 1921, I found one or two birds of the species on each trip to a certain locality on the marshes—a cluster of ponds about one mile inland from the shore of Newark Bay. Selected dates of record follow:

June 11—Two birds, calling.

June 18 to 24—Species frequently heard calling about the same ponds by local hunter, but locality not visited by me.

June 25—Two birds, same locality, calling. I quote from my notes of that date: "Two Greater Yellow-legs were flushed from One Tree Pond on the 25th. One returned repeatedly, was very noisy, and did a spectacular tumble while in flight."

July 2—Two birds, same locality, calling.

July 9—One bird, same locality, calling.

The presumption seems to me reasonable that the straggling birds lingering here up to June 25 and those seen in same locality July 2 were identical in view of: (1) the previous complete absence (according to my records) of the species here June 15 to July 15; (2) the presence of two birds in the same locality whenever that locality was visited by me from June 11 to July 2, 1921; (3) the presence of one bird, in the same locality July 9; (4) the total absence of the species from other normally more favored feeding grounds on the marsh from May 21 to mid-July 1921. Since the birds were heard calling and were well seen there was no chance of confusion in identification.—CHARLES A. URNER, *Elizabeth, N. J.*

A Remarkable Specimen of the Piping Plover (*Charadrius melodus*).—A superb adult female of this rare bird in full nuptial plumage that I secured in May on Long Island, S. C., has the black band on the chest completely coalesced measuring half an inch in width. This band is as wide as on any female Semipalmated Plover (*C. semipalmatus*) in nuptial plumage, but, of course, is not as solidly black basally, the feathers being basally white and apically black as is usual in this species.

If there are other specimens in collections similar to the bird I describe I should like to hear of them, as this plumage for the female is very rare.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Summer Shore Birds.—In the April 'Auk' E. L. Poole records an assemblage of northern breeding Limicoline birds at islands of the Virginia coast, which, for the dates when the recorded observations were made, namely June 30 to July 2, 1921, is truly remarkable. The species noted are as follows: Wilson's Snipe, Dowitcher, Knot, Pectoral Sandpiper, White-rumped Sandpiper, Least Sandpiper, Red-backed Sandpiper, Semipalmated Sandpiper, Sanderling, Black-bellied Plover, Semipalmated Plover and Turnstone.

Let us for a moment suppose we are modifying the given status of these species in a Virginia list, to fit this observation. The simplest way to dispose of it would be to label them all off hand "non breeders sometimes summer." However, the writer's studies of shore-bird movements (mostly on Long Island, N. Y.) lead him to look at the matter differently. Distances mean so little to a migrating shore-bird that the difference of latitude between New York and Virginia is almost negligible, except as it affects climate. In the present connection, the most important difference probably is that, according to available evidence, these birds are more likely

to summer within their winter ranges, without attempting to migrate north, than to do so in transient localities.

Each of the enumerated species has different dates of passage, and each should be considered separately. There is no reason to suppose the Least Sandpiper was in anything but regular migration. The writer has personally observed it on Long Island, bound south, June 22, June 27, and it regularly arrives about the first of July. Dowitcher was probably an early south bound migrant. Though there is no June arrival recorded for it on Long Island, such is to be expected there, since, as a rule, it arrives as early as the more numerous Lesser Yellow-legs, which he has observed as early as June 27. The Pectoral Sandpiper migration is something like that of the Dowitcher, though but few Pectorals appear in early July compared to those later. The Wilson's Snipe would seem a casual early arrival rather than a summering bird, though the earliest such casual Long Island date the writer has obtained is July 10, 1921.

Turn now to the other end of the list, species, the regular northward migration period of which extends well into June, and which may not be expected south again so soon,—Knot, Red-backed Sandpiper, Black-bellied Plover, and Turnstone. If these were moving, they were moving north. The writer would consider the date for all four species a late north-bound date, with a fair chance that the last three would "summer."

This leaves White-rumped and Semipalmated Sandpipers, Sanderling, and Semipalmated Plover, which linger very late north bound, often in flocks, and yet are recorded in return, stray birds, the first week in July. There still is a summer hiatus for each on Long Island, as follows (dates inclusive): White-rumped Sandpiper, June 21 to July 3; Semipalmated Sandpiper, June 28 to July 3; Sanderling, June 15 to July 3; Semipalmated Plover, July 4, one day only. In these species dates over a period of years, with the migration variously early and late, will probably close the gap. That for the Semipalmated Plover, of one day only, may be considered closed. Yet it is doubtful if individuals actually summer on Long Island, though they may do so in Virginia.

It will be appropriate, in closing, to call attention to summer presence of shore-birds on Long Island in 1918, as reported in 'Bird Lore,' Sept.-Oct. of that year, page 359:

"The most notable bird phenomenon on this vicinity was the abundance and lateness of north bound shore-birds, several species lingering through June, the last of this spring flight being a single Ring-neck Plover at Long Beach on July 3 (E. P. Bicknell). As the Least Sandpiper had returned there from the North on that same date (about its usual time of arrival), north and south-bound birds actually met in this latitude. It is assumed that the Ring-neck of July 3 was a straggler from the northward flight, as that species had been present through the month of June. It would be interesting to know whether this individual continued northward

until it met members of its own species returning, remained in this vicinity until they arrived, or turned southward at this point with Least Sandpipers and other birds with which Ring-necks associate."—J. T. NICHOLS, *New York City*.

Passenger Pigeons Not in Company Front.—I saw one very large flock of Passenger Pigeons in, I think, the early or middle sixties, in Acworth, New Hampshire.

They came from the south-west by south; they were not in company front with spaces between companies as a regiment marches; the line was a very long one and took a very long time to pass over my father's house; I suspect the front line was rather pointed but became wider and very regular in the number of birds passing in a given time; they were well up and, I am very sure, we could not hear their wings; they passed over a distant wood, a small river, then over irregular fields and pasture and disappeared over a sugar orchard to the north-east.

The alinement was entirely different from the picture by Mr. Frank Bond (Auk, January 1921) and as to alinement I agree with the views of Mr. William B. Mershon (Auk, April 1922).

The flight must have been in April.—ASHTON E. HEMPHILL, *Holyoke, Massachusetts*.

An Unusual Flight of Black Vultures in Nelson County, Kentucky.—Though a breeding bird of Nelson County, the Black Vulture (*Coragyps urubu*) cannot be rated as abundant at any season. A most unusual flight of these birds appeared at my former home, Cherry Hill Farm, near Bardstown during the spring of 1921.

On the morning of March 19, of that year, I observed, flying rather high over the farm, a flock of Black Vultures which by count was found to number not less than ninety-two individuals, a number by far exceeding the total number of these birds recorded in any single year during a period of observation since 1911. The flock presented a beautiful appearance as the birds soared in a spiral column, each bird beating, intermittently, a few short wing strokes. At times the whole flock in a long train coursed across country on set wings in an orderly manner suggesting the movement of a flock of water fowl, but not a bird moved a wing until they again maneuvered into a spiral column. There days later, March 22, I counted eighty-five individuals which were circling over carrion in the same locality. It was observed that not a single Turkey Vulture accompanied these birds on either date.

The unprecedented occurrence of the Black Vulture in the region about Bardstown during March is the more remarkable from the fact that it is generally quite scarce during the breeding season.—BEN. J. BLINCOE, *Dayton, Ohio*.

The Food of Long-eared Owls.—On January 21, 1922, the roosting place of some Long-eared Owls (*Asio wilsonianus*) was located by us in a grove of young pines north-east of Ann Arbor. There were eight of these owls roosting within fifteen feet of each other. The ground below was littered with disgorged pellets and 110 of these were gathered and were found to contain the remains of the following: 111 Field Mice (*Microtus pennsylvanicus*); 8 Lemming Voles (*Synaptomys cooperi*); 4 Deermice (*Peromyscus* sp.); 2 Shrews (*Blarina brevicauda*); 1 Norway Rat (*Rattus norvegicus*).—A. S. WARTHIN, JR. and J. VAN TYNE, *Ann Arbor, Michigan*.

The Yellow-billed Cuckoo in Europe.—The London 'Field' for Jan. 21, 1922, p. 100, contains a note on the Yellow-billed Cuckoo (*Coccyzus americanus americanus*) illustrated by a photograph of a specimen which was shot on the Scilly Isles, near Lands End, England, in November 1921. Harting's 'Handbook of British Birds' and the 'Hand List of British Birds' by Hartert and others, contain records of 13 earlier occurrences of the species in the British Isles, as follows: England—Cornwall, about 1835; Lundy Island, Devon, Oct. 1874; Helston, Cornwall, Oct. 14, 1887; Bridport, Dorset, Oct. 5, 1895; Ventnor, Isle of Wight, Oct. 1896; Somerset, Oct. 6, 1901; Ringwood, Hants, Oct. 30, 1901. Scotland—Colonsay Isle, Inner Hebrides, Argyll, Nov. 6, 1904. Wales—Stackpole Court, Pembroke, autumn 1832; Aberystevith, Cardigan, Oct. 26, 1870; Carnarvon, Nov. 10, 1899. Ireland—Yoeerghal, County Cork, autumn 1825; Dublin, autumn 1832. On the continent the Yellow-billed Cuckoo has been taken at Bois de Lessines, Belgium, Oct. 22, 1874, and near Turin, Italy, Oct. 28, 1883. All of these records are based on birds collected in autumn and most of them on specimens taken in the month of October.—T. S. PALMER, *Washington, D. C.*

A Large Gathering of Kingbirds.—The Kingbird was first seen in 1921, near Prattville, Ala., on April 10 (two individuals). On May 3, sixty individuals were seen together and May 4, 300 or more were seen in the same place. The temperature was 45 degrees F. By May 7, there were only 20 or 30 birds left, and on May 20 only a pair or two.

I had never seen more than twenty individuals together before, and that was in September when they were preparing for their southward flight. Usually the birds are mated by May 10 or earlier; hence the gathering is the more remarkable.

The place of gathering was on the plantation of J. B. Golsan, two miles from Prattville, in a small grove of mulberries.

The fruit was not fully matured but the birds were eating it to some extent.—LEWIS S. GOLSAN, *Prattville, Ala.*

Arkansas Kingbird in Massachusetts.—As supplementing the reference in 'The Auk' for April, 1922, pages 270-1, to the occurrence of

an Arkansas Kingbird (*Tyrannus verticalis*) in Connecticut, November 4, 1921, the following may be of interest. On my return to Edgartown rather late in the afternoon of November 12, 1921, I noticed in passing by two birds sitting in nearby squares of a wire fence at the side of the road somewhat outside the town. The momentary impression created was that they were flycatchers of some sort and something new. I stopped my car abruptly and started to walk back, but a rapidly approaching car frightened the birds to a perch some distance beyond. Another car still further interfered with my efforts, but I finally got a sufficiently good look at them, in a tree close to some farm buildings, away from the road, to satisfy myself as to their identity, though the heavy clouds and lateness of the hour made observation somewhat difficult. However, there was sufficient light to use my glasses and note that one of the birds was larger and more brightly colored than the other. I reported the birds to Mrs. James B. Worden, of Edgartown, who went in search of them the following morning and found them in the same vicinity. She had an excellent chance to observe them at her leisure, for they were not wild, and to watch them hunting for grasshoppers, of which there was a plentiful supply, due to the general mildness of the autumn. I saw both birds again the same afternoon (November 13) in practically the same place as on the preceding day, and Mrs. Worden saw them once more on the 16th.

—FRANCIS A. FOSTER, Edgartown, Mass.

Arkansas Kingbird in Plymouth County, Mass.—I wish to add one more definite occurrence of the Arkansas Kingbird (*Tyrannus verticalis*) to the rapidly growing number of records from the New England states. On October 30, 1921, I noted two of these birds on the telephone wires near the railroad station at Marshfield Hills. I had no gun with me at the time, but returning the next morning soon after daylight, I was so fortunate as to find the birds within a hundred yards of the same spot, and in the course of a few minutes collected them both. They were young males, moulting heavily about the head and neck, and in rather poor flesh. They are now in the collection of the Boston Society of Natural History.

For the benefit of other possible New England observers, I might add that in general appearance, aside from plumage-color, the Arkansas Kingbird is extremely suggestive of our native Kingbird. Its size, flight and actions seem the same. The lighter upper parts and yellow under parts are of course, quite noticeable, and the yellowish outer webs of the outer tail-feathers are a good field mark at moderate range, even without glasses. The only note heard was a low "pet-pet," such as a Phoebe might make, accompanied by a nervous jerk of the tail.—JOSEPH A. HAGAR, Marshfield Hills, Mass.

Wintering of the Canada Jay in Massachusetts.—The winter of 1921-22 has witnessed at least one proven instance of the sojourn within the

Massachusetts borders of the Canada Jay (*Perisoreus canadensis canadensis*). Several reports alleging this occurrence have been received during the past winter by the State Division of Ornithology. But satisfactory proof was lacking until, during March, a bird of this species was identified by Mr. John A. Farley and myself—found at the end of its winter sojourn in the town of Quincy.

The bird appeared, at the feeding station maintained by Mr. and Mrs. Frank H. Sprague, immediately after the great ice-storm of November 29 last. At first persecuted by the neighborhood Blue Jays, the persistent stranger at length was seen keeping amicable company with one of these—going and coming thus oddly paired during several weeks of mid-winter. The bird was possibly attracted to the place by the extensive windbreak of dense spruce growth that surrounded the house. In one well sheltered tree it habitually roosted.

This Canada Jay completely lost its tail in January; and turned up after a brief interval in early March with an entire new tail—also “in darker plumage” according to the householders. Throughout the winter the bird fed heartily on such fare as baked beans, cheese-rind, cooked carrots and parsnips, bread and spoilt grapes. It became familiar and fairly tame; and occasionally showed a sportive spirit by swooping by or nearly upon Mr. Sprague as he worked in the grounds, seeming to challenge him with harsh chatter and excited cries. Its common note when disturbed was a sharp, penetrating *jip-jip-jip*—not wholly unlike the cry of the Hairy Woodpecker, but generally uttered in triplets. At last reports, March 19, the bird was still on the Sprague estate.

Howe and Allen in their ‘Birds of Massachusetts’ give only three previous records for the State; one seen early in summer, 1875, one taken October 25, 1878, and one taken October 17, 1889.—ARTHUR J. PARKER, Boston, Mass.

The Lapland Longspur in Colorado.—Prior to 1898 the prevailing winter Longspur of Colorado was known as the Lapland Longspur (*Calcarius l. lapponicus*). After subspecies *Calcarius lapponicus alasensis* was erected (1898) these winter Longspurs were all classed under *alasensis*; but since that year there have been recorded three or four specimens of *C. lapponicus lapponicus* as taken in Colorado.

On the evening of December twenty-second, of last year, at six o'clock, during a mild blizzard, with a dense snow fall, I heard overhead hundreds of small birds calling to each other as they flew southward over my residence. The calls, at the time, seemed to me to be those of Horned Larks or Snow Buntings, but a positive determination could not then be made.

Within a few days of this event, Dr. E. E. Evans and Mr. Edward Hellstern, both of Fort Morgan, Colorado, reported to me that hundreds of small birds had been killed in their town during the storm of December 22 by striking houses, wires, etc. Mr. Hellstern felt sure they were Lapland

Longspurs (*C. l. lapponicus*). This diagnosis was one of so much importance and interest that he was requested to send me a specimen, which he did promptly and which, on examination, proved his determination to be correct, that the specimen (others being similar) was true *lapponicus*. Later on Dr. Evans picked up more than twenty of these storm-killed birds and sent them to me; the lot was of mixed complexion, mostly true *lapponicus*, but some *alascensis*. The Biological Survey confirmed my identifications, but reported that many of the specimens of *lapponicus* were not typical, being rather lighter than usual.

I have long suspected that the seeming rarity of the Lapland Longspur in Colorado was more apparent than real, and probably due to lack of properly identified material and insufficient investigation.—W. H. BERGTOLD, 1159 Race St., Denver, Colo.

Bachman's Sparrow (*Peucaea aestivalis bachmani*) in N. E. Illinois.—On April 23, 1922, I took an adult male of this species at Beach, Lake Co., Ill. It was found in one of the pine groves along Lake Michigan and was apparently alone. Dr. C. W. G. Eifrig found a number of birds at River Forest, Ill., during May and June 1915, and secured a specimen which is the only other record of the capture of the species that I can find for this region. (Auk, Vol. XXXVI, p. 522) Dr. A. Lewy saw one in Jackson Park, Chicago, in June 1918 and a note in the 'Wilson Bulletin' (Vol. XXVIII, p. 200) reports them breeding at La Grange, Ill., in 1916, but goes into no detail. This is the first record for Lake County and the farthest north that the bird has been found.—COLIN CAMPBELL SANBORN, Field Museum of Natural History, Chicago, Illinois.

The Carolina Junco (*Junco hyemalis carolinensis*) on the Coast of South Carolina.—On February 4, 1922, I observed a flock of about twenty Juncos near my home and among them a deep bluish bird which differed materially from the others. This bird was so very restless that I followed it for nearly an hour before I procured it. Upon comparing the specimen, which is an adult male, with specimens from the mountains of North Carolina in my collection, and also with typical *J. h. hyemalis* from Mt. Pleasant, I found the bird to be identical in coloration, size and color of the bill with the former. Here is a case of a supposedly resident non-migratory form occurring on the seaboard of South Carolina, which is, of course, accidental. Previous to the capture of this bird one of the worst sleet storms ever known had prevailed for three days in South Carolina, North Carolina and Georgia, the entire surface of the ground being covered with ice to the depth of more than an inch. The capture of *J. h. carolinensis* is an addition to the fauna of South Carolina and makes the forty-fifth species I have added to the State list.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

Junco oreganus montanus in Oregon.—It is rather strange that the Montana Junco (*Junco oreganus montanus*) has not hitherto been recorded from Oregon. It appears to be a fairly common bird both in summer and during the migrations in the eastern part of the State. The following Oregon specimens are in the Biological Survey collection of the United States National Museum:

259673 ♀	Barren Valley, altitude 3950 feet, near Cord	Oct. 11, 1916,	H. H. Sheldon
242986 ♂	Bend	April 15, 1915,	G. G. Cantwell
242260 ♀	Millers, mouth of Deschutes River	April 10, 1915,	S. G. Jewett
259668 ♀	Homestead, altitude 3500 feet	June 7, 1916,	H. H. Sheldon
259667 ♂	Homestead, altitude 3500 feet	June 7, 1916,	H. H. Sheldon
259670 ♀	Homestead, altitude 3500 feet	June 9, 1916,	H. H. Sheldon
258307 ♀	East Pine Creek, 2½ miles northeast of Cornucopia	Sept. 1, 1915,	M. E. Peck
258305 ♀	East Pine Creek, 2½ miles northeast of Cornucopia	Sept. 1, 1915,	M. E. Peck
242271 ♀	Beech Creek	July 2, 1915,	S. G. Jewett

—HARRY C. OBERHOLSER, *Washington, D. C.*

Evening Grosbeak at Ellenville, N. Y.—On the morning of April 19, 1922, as I was wandering through an open patch near to a small wooded tract, a good sized bird flew past me and lit in a nearby birch tree. Its large beak and striking markings convinced me, at once, that it was an Evening Grosbeak. It allowed me to approach to within about five feet of the tree and showed no signs of fear. I watched it for about five minutes during which time it scarcely moved and then it flew and alighted on the ground about twenty feet away. As I approached it again flew and lit in a second tree and this time paid no attention to my careful observation from all sides. It was a full plumaged male bird. Soon my attention was distracted by what sounded like a number of English Sparrows and turning I saw that it was a whole flock of these Grosbeaks, about twenty in number, with more males than females. They were feeding on sumac trees and were quite tame. When I reported the incident I was told that a flock had been observed several times this winter, the last about three weeks ago. I have been absent all winter, so was not aware of this. Although this is the first time I have ever seen the species I am positive of the identification and am reporting it because Mr. E. H. Eaton in his 'Birds of New York' gives it as rare in the State and gives no records at all for it in Ulster Co. Neither does he give any dates as late as this.—GEORGE C. ROSE, *Ellenville, N. Y.*

Evening Grosbeak at Winsted, Conn.—I think we can establish a new Connecticut record for the Evening Grosbeak. I have observed

a flock of from twelve to twenty of this species every few days all winter and saw fourteen individuals as late as May 7, and two May 8, that were surely acting as if they intended to nest in this vicinity. The 'Birds of Connecticut' gives a much earlier date for "last seen."—E. E. MOFFATT, *Winsted, Conn.*

Rare Winter Birds at New Hampton, Iowa.—Northeast Iowa observers have been very fortunate during the past winter in seeing a number of rather rare winter visitants. During the latter part of November I began to observe the Redpolls (*Acanthis linaria*) in small numbers, about four to ten comprising a flock. By Christmas they had increased until flocks of thirty to fifty were seen, not only in this county (Chickasaw) but in Floyd and Mitchell Counties as well. I had seen these birds a number of times prior to this winter, but never in such numbers. The past winter was not colder than commonly, but we had much more than the usual amount of snow.

On January 22, a flock of twelve Evening Grosbeaks, (*Hesperiphona vespertina*) was seen in New Hampton, and during the same week others were observed at Osage, in Mitchell County. The birds for the most part fed on the seeds of the box-elders and by the time they were through with a tree, the snow beneath would be littered with the pods. The birds remained about three weeks in this vicinity.

On February 5, the Bohemian Waxwings (*Bombycilla garrula*) visited New Hampton, and as there were a number of groups in different parts of town at the same time, it was estimated that there were about forty in the flock. They remained about ten days. The Waxwings were also seen by the Osage observers.—CHAS. J. SPIKER, *New Hampton, Iowa.*

Bohemian Waxwings at Topeka, Kas.—On November 28, 1921, a small flock of Bohemian Waxwings was seen flying south very rapidly. I saw no more of them until January 25, 1922, when there was a flock of about forty present. January 26 the flock had increased to about sixty. Apparently a few Cedar Waxwings were mixed in with them. The following day the birds were seen at close range feeding on cedar-berries. On the twenty-eighth the note was heard, but no birds seen.

Not until February 23, was the note again heard. March 13 a large flock of Waxwings was seen. The majority, if not all of them, were Bohemians, judging from the notes. Time did not permit a close investigation. March 14, four birds were seen. On the following day about six were seen, and that was the last appearance for this season.

This is the second season in which this bird has been present in the last five years. Great numbers were here during the wide-spread southern visitation of 1919-1920.—A. SIDNEY HEYDE, 1615 College Ave., *Topeka, Kas.*

Wilsonia pusilla chryseola in New Mexico.—A specimen of *Wilsonia pusilla chryseola* in the Biological Survey collection of the United States National Museum adds this subspecies to the list of the birds of New Mexico. It was discovered in a recent rearrangement of the collection, and is of interest in extending the known migration range of this form considerably to the east. It is a juvenal female, No. 196903, United States National Museum, and was taken by Mr. Ned Hollister at Riley, Socorro County, New Mexico, on September 24, 1905.—HARRY C. OBERHOLSER, Washington, D. C.

Wilsonia pusilla pusilla in Colorado.—Although the eastern form of Wilson's Warbler (*Wilsonia pusilla pusilla*) has a number of times been credited to Colorado, there seems to be but a single published record that is based upon recent specimen examination. This is cited by Mr. Ridgway (Bulletin U. S. National Museum, No. 50, II, 1902, p. 710). Since, however, the full data have never, so far as we are aware, appeared in print, it may be well, for the sake of those who have not access to the specimen, to publish these particulars. The bird in question is an adult male, taken at Fort Garland, Colorado, on May 28, 1873, by Mr. Henry W. Henshaw. It was originally catalogued in the United States National Museum collection as No. 79,516, but was subsequently exchanged and is now in the Colorado Museum of Natural History at Denver, Colorado.—HARRY C. OBERHOLSER, Washington, D. C.

Nesting Sites of the Long-billed Marsh Wren.—Mr. Aretas A. Saunders in the April number of 'The Auk' states that the Long-billed Marsh Wren "breeds mainly, if not entirely in cattail marshes" and he adds it has been his experience that this bird "is found only in those marshes containing the narrow-leaved cattail."

In the extensive Topsfield meadows of the Ipswich River this bird breeds abundantly, not in cattails, but chiefly in the great bulrush (*Scirpus validus*). A list of the plants among which it builds its nest here may be found in my 'Birds of Essex County' and a photograph of the nesting region constitutes the frontispiece to the Supplement to the same work.—CHARLES W. TOWNSEND, 98 Pinckney St., Boston.

Defense Note of Chickadee (*Penthestes atricapillus atricapillus*).—On May 17, 1921, noticing a hole about a foot from the ground on a fence post, I stooped down and peered into the cavity to see if it contained a nest. As I did so there issued from the hole a harsh, hissing sound that was decidedly startling. Securing a stick I thrust it repeatedly into the entrance, each time provoking the hissing sound. Unable to account for this extraordinary salutation and obsessed with the idea that it might be produced by a snake, I pried away a piece of the wood and out flew a chickadee that had been defending a nest containing eight eggs.

I have examined numerous nests of this species in various parts of its range, but have never had a similar experience.—A. W. SCHORGER, *Madison, Wis.*

Notes from Collins, N. Y.—I note in the last 'Auk' Mr. Thomas L. Burne's account of the nesting of the Alder Flycatcher in Erie County. My records from 1912 contain an account of the breeding of one to three pairs in the town of Collins, in three different swamps. Before this time, I am inclined to think that I confused it with the Acadian Flycatcher.

Within easy walking distance, in fact almost in sight, are always two singing males and about one mile distant, usually another. On June 13, 1917, I found a nest being built and it soon contained three eggs. It was between four and five feet up, in a spice bush, in a swampy place, not well concealed. Since then, every season has brought a singing male to the same area, but I have never tried to find the nest. As the bird is now singing there, I shall make an effort to locate it.

The Cardinal Grosbeak was first observed by me May 5, 1913, and has been seen every year since, the greatest number at one time being six, on December 26, 1921. As these were all females, there must be at least nine, as there are three adult males besides. On May 7, 1922, in the woods of the hospital grounds, I found a female building. The nest was not well hidden, in a hemlock, five feet from ground and contained one egg. On May 12 the nest was empty and finely crushed egg shells under it. On May 15, I found the female beginning another nest, about seven or eight feet from the ground, also in a hemlock, poorly concealed; she is at present incubating, in spite of too numerous red squirrels, crows and jays.

Another pair are constantly in the same location near the Cattaraugus Creek, year after year. Gowanda, two miles distant, boasts of one, if not a pair, and several have been taken near Eden (Erie County) for the Buffalo Society of Natural History.

Several Canadian Warblers are nesting as always, also the Louisiana Water-Thrush, Juncos, several Parula, Magnolia, Hooded, Blackburnian Black-throated Green and Mourning Warblers. I have also in times past found the nest of the Black-throated Blue Warbler.

On June 18, 1917, I found the nest of the Migrant Shrike with six newly hatched young. Nearby, parents were feeding another brood, out of the nest. This is the only nest of this species that I have found.

On June 6, 1915, I found a pair of Blue-headed Vireos building in the Gowanda Glen. Owing to my absence during the summer, I did not follow the subsequent history of the nest and have never since found them breeding.—ANNE E. PERKINS, M. D., *Gowanda Hospital, Collins, N. Y.*

Notes from Essex, Massachusetts, 1921.—*Uria troille*. COMMON MURRE.—On May 18, I secured a female on the Essex River, in Essex. It appeared to be in a somewhat sickly condition and its tarsi were somewhat swollen, facts which may account in part for its presence here at this late date. Its stomach was replete with the remains of fish. This is the first definite record of this species for Essex County. The mounted specimen is now in the collection of the Boston Society of Natural History.

***Sterna caspia*.** CASPIAN TERN.—Three birds appeared on the Essex River, August 31. They were seen fishing in the river and later resting with Herring Gulls on the shore. Two others were seen on September 8 near the mouth of the river. The stomach of one secured, was kindly examined for me by the U. S. Biological Survey, and its contents found to be two codlings (*Urophycis tenuis*).

***Casmerodius egretta*.** AMERICAN EGRET.—On the salt marsh of Essex River I saw a flock of three on August 19.

***Phalacrocorax carbo*.** COMMON CORMORANT.—On September 2, flying low over the water off the mouth of the Essex River, two birds of this species were identified with a flock of twenty-five Double-crested Cormorants. They were obviously larger than the latter with white breasts, and their paler bills and gular patches were in distinct contrast to the orange color of these parts in the Double-crested species. All the birds in the flock held their bills widely open as they passed, presenting a peculiar appearance.

***Coturnicops noveboracensis*.** YELLOW RAIL.—One was started in the salt marsh on September 10.

***Limosa fedoa*.** MARBLED GODWIT.—A female was killed on the Essex River on August 31. Its stomach contents were examined for me by the U. S. Biological Survey and found to consist of 14 Nereis, 6 *Gemma purpureus* and at least four other bivalves, and a seed of the pondweed (*Potamogeton pectinatus*).

***Falco rusticolus obsoletus*.** BLACK GYRFALCON.—A fine black female was shot on the edge of the salt marsh at Essex on December 10. It had been seen several times previously and when killed was said to have been attempting to carry off a domestic hen from a farmer's flock. Its crop was greatly distended and on examination was found to be crammed with the flesh and breast feathers of a Black Duck. The specimen is now mounted in the collection of the Boston Society of Natural History.—ARTHUR B. FULLER, *Boston Soc. Nat. Hist., Boston, Mass.*

Notes from Lauderdale, Fla.—At Ft. Lauderdale, Fla., February 12, 1922, I saw a male Nonpareil (*Passerina ciris*). A day or two later I saw it again in the same general vicinity where, for the third time, I saw it, February 19. On the last occasion I flushed it, together with some Grasshopper Sparrows, from a growth of tangled grass where, evidently, these finches had taken refuge for the night. Maynard refers to this

species as shy and retiring and states that they seldom show themselves in the open. Twice, at least, I observed the bird under conditions which would seem to controvert this statement.

A Loon (*Gavia immer*), was picked up on the golf links, Ft. Lauderdale, Fla., February 14, 1922. The bird appeared to be uninjured and submitted, without resentment, to stroking and handling. It made one or two attempts to paddle away, using only its feet, but made little progress. Finally it was carried to the river, about three miles away, where it dove and splashed with evident enjoyment.

The golf links are about as far from the ocean as from the river. The country round about consists of pine land, cut-over land overgrown with palmetto scrub and some truck gardens. It may be that the links, set in an opening of this scrub growth, being nearly level and perhaps covered with mist at night, appeared to the bird as a body of water and that, once down, it was unable again to rise. I think most accounts agree that a Loon is unable to rise save from the water.—EDW. R. FORD, *Grand Rapids, Mich.*

Birds Using their Wings as a Means of Propulsion under Water.—

Mr. Charles W. Michael and his companion can be congratulated on the excellent photographs and extremely interesting article on the Harlequin Duck which appeared in 'The Auk' for January, 1922. Closely watching various species of diving birds, an observer notes two distinct means of propulsion under water: (I) by the use of the wings which are not fully expanded in this swimming below the surface, but are bent at the carpal joint; (II) by using the feet alone.

Having for many years had opportunities of observing the Murre (*Uria troille troille*), Razor-billed Auk (*Alca torda*), and Puffin (*Fratercula arctica arctica*), diving when the water was clear, around the coasts of Scotland, I can confirm the statement that these species all use the wings for propulsion, that is to say, the Auk family make use of the wings when travelling beneath the surface.

The Manx Shearwater (*Puffinus puffinus puffinus*) does the same, although of course it is not such an inveterate diver as the Auks. The other big petrel, the Fulmar, is said to do the same but I cannot speak of this bird from personal experience.

In Class II there are Loons, Grebes, Mergansers and Ducks. Close to my home, on the Lower Arrow Lake, B. C., there is a beaver dam, where almost any day may be seen Buffleheads, Golden-eyes, Coots, Mergansers and occasionally other species as well, diving at pretty close quarters. The water is still, and usually quite clear. Here these birds use the paddles alone for propulsion under water. The following is the mode of procedure with them when feeding.

A Golden-eye or Bufflehead floating on the surface which is about to dive, may or may not submerge a little before doing so, and may occasion-

ally partially open the wings before plunging headforemost beneath the surface. Very little disturbance of the water takes place when diving. it is more a slipping beneath the surface, which is often effected by a slight spring, forward, not by a leap out of the water as is generally the case with grebes. Under water the wings are closed, the tail spread, the paddles work alternately, being thrown vigorously backwards and outwards, thus avoiding the edge of the spread tail, and are sometimes thrown back so far that they appear to reach a little higher than the back. The tail is sometimes depressed, sometimes elevated, to adjust the angle the bird wants to maintain. When bottom is reached the body is held down by the strokes of the paddles, generally at an angle of about 45°, while the bill rakes the mud. Occasionally the bird slightly loses its balance and rolls over a little, when a wing is shot out, but the moment balance is restored the wings are kept closed, the paddles doing all the work.

The return to the surface is by buoyancy alone, the head breaking water first, the body sloping slightly downwards, though sometimes the duck pops up horizontally, the feet are not used in rising to the surface.

One October morning I was lying concealed in my sneak-boat in the very shallow narrow outlet of a remote slough, when a female Golden-eye evidently mistaking the boat for a log, came feeding slowly past me, within a few feet of the punt, the water was so shallow that when she submerged there was only a thin film over her back.

The paddles were thrown back with great force, and appeared sometimes to reach a little higher than the level of the back. The bottom being soft she could not have obtained any foothold by walking.

A male Merganser is very conspicuous under water, using the feet alone for propulsion, and can travel at an extraordinary pace in this submerged swimming.

Very interesting is the observation made by Mr. Michael that the Harlequin uses its wings under water, and walks over a gravel bottom.

Is the Harlequin an exception to the general rule, or do all diving ducks have to use their wings in a current? Even here perhaps, they are used more to retain balance than as natatory organs. All of my observations on diving ducks have been in waters where there was little or no current.

The Coot also uses its feet when diving. This clown among birds may often be seen after a short dive to pop up tail first.

Mistakes may be made when observing birds under water, especially if the water is not very clear, light may strike the tail or paddles, and make it appear as if the wings were employed. There is little use in observing wounded or captive birds, for a broken wing or even broken wing tip may easily give the impression that the wings are used.

Guillemots or Razor-bills when confined in a comparatively small aquarium, feeding on the dead or moribund fish supplied them, may give up using their wings and reach their food with a few kicks of the feet

In this case the birds appear at first to use their wings which often come in violent contact with the glass; this apparently soon teaches them that the use of the wings is both superfluous and painful.

I have not so far observed a Harlequin in the Beaver Dam, though they are not very uncommon on the Arrow Lakes.—J. E. H. KELSO, M. D., Edgewood, Lower Arrow Lake, B. C.

Bird Catastrophe at Gordon, Nebraska.—The morning papers of February 20, 1922, carried the news that on the previous night thousands of birds were killed at Gordon, Nebraska, during the blizzard and that no one in the town was able to identify them. I immediately wrote the mayor, Mr. Frank Coates, and asked him to mail me a specimen for identification along with full particulars concerning the storm. He very kindly sent me two specimens. I found them to be Lapland Longspurs (*Calcarius lapponicus lapponicus*). To confirm my verdict I mailed one bird to the Bureau of Biological Survey, and from it received word that my identification was correct. The following information was furnished by the mayor of Gordon.

At six o'clock on the evening of February 19, the temperature was 34 degrees above zero. During the night it stood at 16 degrees above. Early in the evening (Sunday) a sleet fell, followed by a fall of one inch of snow. There was no wind and the snow was evenly distributed. At 10 P. M. the birds were flying against the cluster lights in such numbers that the lights were turned off. Next morning before one store having dim lights fifty-five birds, dead or nearly so, were counted. A conservative estimate as to the number killed was twenty-five to a city block. Thousands were killed in the surrounding country, the mortality extending over a territory ranging 200 miles both east and west of Gordon.

'The Auk', volume XXIV, for October 1907 gives an account of a similar tragedy which occurred in Minnesota in 1904.—BESSIE PRICE REED, Lawrence, Kansas.

Flight Songs and Mating Songs.—The interesting paper by Mr. Aretas A. Saunders on 'Flight Songs and Mating Songs' in the April number of 'The Auk' brings up several questions. Of the birds that are in the habit of singing from perches, a certain number—possibly more than we know—indulge at times in flight songs which generally differ more or less from the ordinary song. The fact that many birds continue their songs, both ordinary and flight, long after the courtship season, does not, it seems to me, prevent these being true courtship songs. The Robin sings even into August and the Song Sparrow has been known to sing every month of the year. The songs of most birds deteriorate as the season advances.

The full song of the Black and White Warbler, to which Mr. Saunders refers, is in my experiences common during the courtship season, but may

be continued afterwards. Nearly all birds sing again in the fall,—the well known “autumnal recrudescence of the amatory instinct”—and the full flight song is often to be heard at this season.

Mr. Saunders has shown clearly that the Bobolink-like flight song of the Meadowlark is more ancient than the ordinary song. In some cases, it seems to me, the flight song is plainly an elaboration of the ordinary courtship song, while in others it is a return to a more primitive and passionate, but less evolved utterance. Some ecstatic flight songs fall under both these heads, and by this I mean that parts of the flight songs are elaborations and variations of the common songs, but that numerous inarticulate and sometimes unmusical notes of a primitive nature are intruded.—CHARLES W. TOWNSEND, 98 Pinckney St., Boston, Mass.

Aeolian and Percussion Bird Music.—The non-vocal forms of bird music, though not so widely distributed as those produced in the throat, are sufficiently positive to be deserving of separate recognition and special terms.

There are two types: those sounds produced by any kind of tapping or beating, which may be termed percussion music; and those induced by the action of extraneous air currents on the outstretched wing feathers, a type perhaps best designated as aeolian. Like song, both are probably expressions of sex pressures in the male, and both are primarily seasonal.

Percussion music may be subdivided into that made with the bill and that with the wings. The best example of the former is the resonant roll of the Flicker, which in mating season is sure to find some hollow tree or tin roof that will megaphone the returns of his “riveting hammer” equipment.

The second kind of percussion music has its clearest exposition in the Ruffed Grouse, which produces his gallant staccato *accelerando*, as instantaneous photography shows, by beating his wings together above his back. It is the tympani roll of the timberland symphony. Drumming is so prominently a part of the cock Grouse that it is not limited to his mating season.

Aeolian music is the most picturesque form of avian expression. Who that has seen the Nighthawk mounting in the soft May twilight to his spectacular swoop and aeolian boom can have watched the act without a thrill?

But the master aeolian artist is a bird of a widely different order. A sketch from the migration course in the lower Susquehanna valley will illustrate.

After a whirling, piling February blizzard there is a thaw and a warm drizzle. With upland bare and soggy and meadow flooded March comes at misty midnight. And with it, out of the gloom above, comes the mysterious winnow of the Wilson's Snipe. It is the first nocturnal announcement

of spring and the long-billed herald plays to no spot but sends down his message to the sleeping village as well as to the broad bottoms of his favorite swamp.

That softly penetrating roll of the Snipe is one of the most remarkable sounds in bird life. Very rarely, in wild cloudy weather during the vernal flight, the bird, "drums" in the daytime. From memory of one of these exhibitions the wiry traveler can be imagined up in the damp darkness going through the extraordinary evolutions that accompany the sound. He drives about in large circles for several minutes at highest speed, which is well above ninety miles an hour with the Snipe; then, suddenly setting his outstretched wings, he descends sharply and obliquely for fifty or sixty feet, producing the roll or winnow as he makes the drop. The sound is apparently made with the primaries thrown into vibration by the strong rush of air. Knowing the harsh 'skeap, skeap' of the Snipe as he jumps from the grassy springhead it is impossible to imagine the beautiful, soft roll as coming from his throat.

The first impression of the Snipe's winnowing is that it is the roll of the Screech Owl. With closer attention it seems too big and too free a tone for an *Otus*, and it is altogether out of habit for that bird to give a roll without an ascending quaver at the end. But nevertheless the tone is so owl-like that it suggests the possibility of some large, unfamiliar variety of owl, to which the novice is likely to attribute it or leave it a mystery for later solution. And one of the singular qualities of this curious music is that the position of its source is altogether baffling. When as a boy I first heard the sound in the daytime I hunted through the nearby trees for the expected owl only to discover to my amazement that the roll was coming from a Snipe, in a mad acrobatic act, nearly half a mile up in the air.

The whole performance appears purposeless, particularly in a species so seemingly unemotional as the Snipe. It may be a wild game evolved in both sexes by the stored up energy which is provided in extra amount for the great flight, and evoked by a stormy day or some wild element in the gloomy night. Frank Forester, the classic writer on American field sports of the early nineteenth century, described large wisps in the act of drummery, though the snipe he saw may have been all males at that. Or it may have to do solely with the mating instinct and be an act of bizarre intersexual gallantry peculiar to the male.

In any event the aeolian music of the Snipe in the night always touches a responsive cord within me as deeply as does the twilight song of the Wood Thrush.—HERBERT H. BECK, *Franklin and Marshall College, Lancaster Pa.*

RECENT LITERATURE

Nelson's 'Lower California and its Natural Resources.'¹—Most American naturalists are aware of the extensive exploration of the Lower California peninsula carried on in the years 1905–1906 by Dr. E. W. Nelson and E. A. Goldman, as part of the general survey of Mexico under the auspices of the Biological Survey, but hitherto no report of their operations has appeared. The present account is based primarily upon this exploration with such additional matter, from other sources, as seemed worthy of incorporation. The itinerary covers about thirty pages and is a most interesting narrative, illustrated by numerous excellent views of the varied country through which the expedition passed. Then follows an account of the physical characteristics; recent geological history; coastal and other mountains, comprising descriptions of the various mountain chains of the peninsula; the plains, valleys and streams and the coastal islands. The climate is then considered, and finally the plant and animal life, and its distribution. There are 166 mammals, 286 land birds, 144 water birds and 102 reptiles known from Lower California and its adjacent islands.

Dr. Nelson considers that there are five natural faunal areas in the peninsula; the San Pedro Martir District, comprising the summits of the Sierra Juarez and San Pedro Martir Mountains, forming the back bone of the northern part; the San Diegan District lying immediately west of this; the Colorado Desert District to the east; the Vizcaino Desert District reaching from coast to coast and occupying the middle section of the peninsula and the Cape District occupying the southernmost third.

In terms of the life zones, the mountains of the San Pedro Martir District are Transition with a slight area of Canadian; the San Diegan District is Upper Sonoran, while all of the Vizcaino and Colorado Desert Districts and a narrow strip running through the Cape District, with isolated areas at the Cape itself, are Lower Sonoran, the rest of this district being Arid Tropical, except for an area of Upper Sonoran on some of the highest mountains. The Arid Tropical and Lower Sonoran of the Cape District are, however, so inextricably interwoven that it is difficult to separate them.

Most of the species peculiar to this region occur on the mountains south of La Paz, (Upper Sonoran) and doubtless originated when this area was cut off from the rest of the peninsula by the sea. Lists of the characteristic animals and plants for each district and zone are given. The final pages of the report comprise sections on natural resources and agriculture and an excellent bibliography with historic comments on the early explorers and their routes.

Dr. Nelson has furnished us with an account of this interesting peninsula

¹ Lower California and its Natural Resources. By Edward W. Nelson, Chief, Bureau of Biological Survey, United States Department of Agriculture. *Memoirs Nat. Acad. Sci.* Vol. XVI. First Memoir. 4°, pp. 1–194, pll. 1–35. 1921.

which will constitute the standard work of reference for a long time to come, and thanks to his researches we, for the first time, gain a clear knowledge of the distribution of life in this region. The admirable map which accompanies the report is a valuable feature.—W. S.

Chance's the Cuckoo's Secret.¹—We have from time to time noticed in the pages of 'The Auk' the publications in the British ornithological magazines dealing with the life history of the Cuckoo and commented upon the remarkable results that our friends across the water have attained through their painstaking studies. In the fore-front of this investigation stands Mr. Edgar Chance, who has now embodied all of his observations on the egg-laying habits of this interesting bird in the little volume before us.

He has recorded four seasons' detailed observations on what he considers to be the same female Cuckoo, and other chapters on more general problems in the life-history of the species. One must read the book to appreciate the painstaking work of the author and the importance of his investigations and only a brief summary of them can be given in this connection.

In the first place British ornithologists seem to be unanimous in the belief that individual Cuckoos lay eggs that are characteristic, and distinguishable from the eggs of other Cuckoos in the same vicinity, and also that under normal conditions an individual Cuckoo is parasitic on only one species of bird—the victim being known as the "fosterer" in the language of Cuckoo investigation. It would also seem that in the case of the Cuckoo it is the female that selects the breeding area and not the male, this being in contrast to the custom prevalent in most birds as described in Howard's 'Territory in Bird Life' and in Mr. H. Mousley's recent paper (Auk, July 1921).

The unique method of nidification in the Cuckoo is ample explanation for this reversal, while the fact that the same type of egg is found in the same area year after year, indicating the presence of the same individual cuckoo, confirms this theory.

All of these points are supported in a convincing way by Mr. Chance's observations. The most interesting features of his researches are however that he was able in 1920 to locate probably every egg laid by this special Cuckoo which he had under observation, and in most cases to record the day and hour at which each was laid. There were 21 eggs laid, all but one in Meadow Pipits' nests, and at intervals of two days (except in two instances). So accurately did Mr. Chance forecast the day and nest in which the Cuckoo would probably lay that he was able to place a motion

¹ The Cuckoo's Secret. By Edgar Chance, M. B. O. U. London: Sidgwick and Jackson, Ltd. 3, Adam Street, W. C. 2, 1922. pp. 1-239. Numerous illustrations. Price 7s. 6d. net.

picture operator in a blind and secure a film of the performance, including the removal of a Pipit's egg by the Cuckoo, which seems normally to follow the deposit of its own egg.

The Cuckoo's exact method of depositing her egg seems not to have been even yet positively ascertained. Mr. Chance construes his evidence as proving that an egg can be laid in eight seconds, the period that the bird under observation was actually on a nest and left an egg which was not there before, and he also claims that in other instances it can be retained for hours after the bird has become anxious to lay it. Mr. Stuart Baker in a valuable paper on this subject, (Bull. Brit. Ornith. Club, March 13, 1922,) regards both of these claims as improbable and says "there is no doubt that in the vast majority of cases the egg is laid by the Cuckoo elsewhere, and deposited by means of the bill in the foster-parent's nest," and further suggests that she holds her egg in her gullet and regurgitates it into the nest. He actually interprets Mr. Chance's film as endorsing this view.

Mr. Baker's admirable paper should also be read with care especially as it deals with African and Asiatic Cuckoos which must obviously be considered in solving the broader problems of the Cuckoo's parasitism.

Mr. Chance is certainly to be congratulated upon his admirable work and the great progress that he has made in the attempt to solve "the Cuckoo's Secret."—W. S.

Beebe's 'A Monograph of the Pheasants' Volume III.¹—True to their promise the publishers have brought out the third volume of this splendid work promptly on the appointed date. The character and make-up of this volume are quite up to the standard of the preceding ones and so fully have these been described in our reviews of the other parts² that it seems unnecessary to repeat the details here.

With regard to the plates of the several species this volume is quite up to the standard of the last, although, as in that, we miss the exquisite work of Thorborn and its wonderful reproduction which characterized Volume I. The eight plates by Lodge will probably be most appreciated among those of the volume now before us, although those by Jones, representing the races of *Phasianus colchicus*, are admirably adapted to the differentiation of these closely allied birds. The characters are far better shown in a series of "portraits," such as these, by a single artist, in which the birds are placed in approximately the same position and drawn

¹ A Monograph of the Pheasants. By William Beebe, (etc., etc.,) Volume III. Published under auspices of the New York Zoological Society by H. F. and G. Witherby, 326 High Holborn, London, England, 1921. Royal Quarto (12 × 16 in.) pp. i-xvi + 1-204, colored plates 24 (Nos. XLV-LXVIII), photogravures 21 (Nos. 40-60) and 4 maps. Edition limited to 600 copies; price of each volume \$62.50.

² For notice of Volume I see 'The Auk' January, 1919, of Volume II, July, 1921

to about the same scale, with only a trace of background, than in more artistic compositions where the subjects appear in varied poses and of different size. These pheasant portraits that Mr. Jones has produced are wonderful in their almost Japanese delicacy and detail and in some the suggestion of iridescence is most successfully produced.

The work of two new artists appear in this volume, L. A. Fuertes and E. Megargee. The plate of the Cheer Pheasant by the former is an admirable representation of the principle of protective coloration so characteristic of this dull colored species, but its very excellence in this respect makes it less beautiful than the plates of the more brilliant species which Lodge has depicted against dark backgrounds. Fuertes was again unfortunate in having to portray Elliot's Pheasant of rather bizarre coloration and the large size of the figure has not added to the effect. Megargee's single plate of Soemmerring's Copper Pheasant, is not very impressive, while Knight's plate of Reeve's Pheasant demonstrates again, to our mind, the impossibility of using oil paintings for such reproductions as these. All of this discussion serves only to demonstrate what must be apparent to all who have been asked to judge of the respective merits of various pictures of mammals, birds, etc. It is almost impossible to say "this one is the best" because one may be the most artistic, another the most important from a scientific point of view, another most perfect in pose and coloration, while in all, the method of reproduction and the size of the figures are bound to influence our opinion.

The photogravure reproductions of Mr. Beebe's photographs of the haunts of the various species are particularly beautiful and continue to add much to the attractiveness of the work. The groups covered by Volume III comprise the Koklass Pheasants (*Pucrasia*); the Cheer (*Catreus*); the True Pheasants (*Phasianus*) and the Long-tailed Pheasants (*Syrmaticus*). The last group is remarkable for the great difference in the plumage of the several species, including the copper-colored Soemmerring, the yellow and black Reeve's and the blue and black Mikado. The last, the most recently discovered pheasant species, has an interesting history. It is a native of Mt. Arizan, Central Formosa, and was described by Ogilvie Grant in 1906 from two central tail feathers obtained from a native head dress. They were so distinctive as to indicate a new species beyond any question of doubt, though a specimen of this beautiful bird was not obtained until several years later.

The genus *Phasianus* is one of the great puzzles of the pheasant family on account of the large number of hybrid forms developed in captivity and the confusing array of geographic races. Following his criterion on genera—that they are geographic and non-overlapping, Mr. Beebe has separated *Syrmaticus* and *Calophasis*, sometimes included in *Phasianus*, and he has recognized only two species among the forms remaining. *P. versicolor* of Japan, and *P. colchicus*, extending, in one or another of

its forms, all across Asia from the Sea of Azof and the Black Sea to the Japan Sea, and from the Tropic of Cancer to 48° N. Latitude, in Manchuria.

Beebe's statement that in a single ricefield in China representatives of three recognized forms of *P. colchicus* were obtained and two undescribed ones illustrates the variability of the characters that might and often have been regarded as of systematic value. No less than 35 forms of this species have been named of which Beebe recognizes 23, admitting at the same time our very imperfect knowledge of the birds in much of their wide range, and the lack of suitable series of specimens for study and comparison. We shall look with interest for the fourth and concluding volume of this notable work which the publishers promise before the close of the year and congratulate both them and the author upon the painstaking care and energy which have produced such splendid results.

—W. S.

Van Oort's 'Birds of the Netherlands'.¹—This triple installment consists entirely of plates, covering many of the Hawks, Eagles, Quail, Shore-birds, Rails and Cranes, the thirty plates bearing numbers between 89 and 183. They are of the same high quality as those in preceding parts and, although the large size of some of the figures and the crowding on certain of the plates detract from their artistic beauty, they are admirable for purposes of identification while the representation of the various plumages adds materially to their value. The publisher is making excellent progress with the plates and promises the letter press in succeeding parts.—W. S.

Swann's revised 'Synopsis of the Accipitres.'¹—Mr. Swann after a further study of his subject decided to issue an entirely new edition. This follows exactly the style of the original edition but contains many additions and changes in nomenclature, and some alteration in the systematic arrangement. The author has received assistance and criticism from many sources and has had access to a manuscript list of Accipitres prepared recently by Mr. W. L. Sclater, all of which have helped to make the list as complete "as human exertion" can make it, though the author admits that further corrections, etc., are inevitable. The number of species now

¹ Ornithologia Neerlandica. De Vogels van Nederland door Dr. E. D. Van Oort. Gravenhage Martinus Nyhoff. Afl. 10-12.

¹ A Synopsis of the Accipitres (Diurnal Birds of Prey). By H. Kirke Swann, F. Z. S., M. B. O. U. Corresponding Fellow, Amer. Orn. Union. Second Edition, Revised and Corrected throughout. London. Wheldon and Wesley, Ltd., 38, Great Queen Street, Kingsway, W. C. 2, and 28, Essex Street, Strand, W. C. 2, Price 6s. per part. Part I (Sept. 28, 1921) pp. 1-63; Part II. (Jan. 3, 1922). pp. 65-122; Part III, (Feb. 16, 1922) pp. 123-178 plus addendum to pp. 3-4 and Errata et Addenda i-iii; Part IV, (May 20, 1922) pp. 179-233 plus title, preface and index, i-viii and 1 page Errata et Addenda.)

recognized is 329 as against 316, and of genera 99 as against 89 in the earlier edition.

We notice that the genera *Climacocircus*, *Urubitornis*, *Oroaëtus*, *Thalassoaëtus*, *Cuncuma*, *Helicolestes*, *Aviceda*, and *Rhynchofalco* have been recognized, while *Neohierax* (p. 184) is proposed as a new genus, with *Poliohierax insignis* as type, and the following new forms are proposed *Odontriorchis palliatus guianensis*, Paramaribo, Surinam; *O. p. mexicanus*, Tampico, Mex., and *O. forbesi* Pernambuco, Braz. (all on p. 159).

- *Polioaëtus* we notice is shifted from the Pandiones to the vicinity of *Haliaëtus* and *Pithecophaga* to the Harpy Eagles, while the genus *Archibuteo* (now *Triorchis*) is still regarded as distinct instead of being merged with *Buteo* as advocated by Oberholser.

Mr. Swann has certainly spent much time and pains on this new edition of his list and our knowledge of the group has been materially advanced. —W. S.

Mathews' 'The Birds of Australia'.¹—Three parts of Mr. Gregory Mathews' great work have appeared since our last notice, and in all the high standard previously established has been maintained. They cover the families Cyclostomatidae, Turdidae and Sylviidae.

The first of these includes a number of characteristic Australian birds which the early settlers were at a loss to identify with the British species that they were familiar with at home, and hence we have such divergent popular names as, Babbler, Song-Lark, Field-Wren, Scrub-Robin, etc., while some especially notable species have received distinctive names from their peculiar vocal accomplishments as the Pilot Bird and Coach Whip Bird. The habits of all these are covered by quotations from Gould, and contributions from Ashby, Carter, White and other present day Australian ornithologists and correspondents of the author.

The thrushes are represented only by a species of *Oreocinclá* and the so-called "Chats."

We note two new races described in Part 5. *Drymodes brunneopygia intermedia* (p. 214) western So. Australia, entire diagnosis "paler and more rufous" and *D. beccarii adjacens* (p. 218) Aru Islands "darker above especially on the tail." There is no clue as to where the types may be found. If as is quite probable another form may some day be found on the Aru Islands, this careless description of Mathews' will serve as a stumbling block until the location of the type is discovered and a comparison is made. It is curious that an investigator who has spent so much time and energy in ably correcting and elucidating the careless work of his predecessors should himself be guilty of similar lapses.—W. S.

¹The Birds of Australia. By Gregory M. Mathews. H. F. and G. Witherby. London, England. Vol. 1X. Part 5 (December 15, 1921), Part 6. (February 15, 1922), Part 7 (April 4, 1922).

Bannerman on 'The Birds of Southern Nigeria'.¹—This first installment covers all of the passerine birds from Southern Nigeria contained in the British Museum collections; the other families it is proposed to treat in another paper in the same journal. The paper is almost entirely systematic though a few collectors' notes on habits, food, etc., are interpolated. Usually only range is considered with reference to the original description of the form, but there are often a few lines of "distinctive characters" and in complicated cases considerable discussion of the status of the various described forms.

We notice the following new race described: —*Tschagra senegala chadensis* (p. 355), Lake Chad district. Apparently this is the only one but without some list of new forms or some distinctive style of type it is very difficult to locate them in a paper abounding in technical names. Mr. Bannerman has prepared a review which will prove a most important work of reference for students of African birds.—W. S.

Witherby's 'Handbook of British Birds'.²—This part of Mr. Witherby's excellent 'Handbook' covers the remainder of the ducks, the Steganopodes and the Tubinares. All the admirable characteristics of the earlier parts are maintained, the descriptions are full and the questions of range and related forms carefully worked out. In this connection many American birds are referred to and the work becomes of importance to American ornithologists in the study of our own avifauna. The American Eider, *Somateria dresseri*, is here regarded as a subspecies of *mollissima* as is the Pacific bird *v-nigra*.—W. S.

Kutchin's 'What Birds Have Done with Me'.³—This little volume consists of a number of popular essays on various aspects of bird life and of bird biographies, with much that is autobiographical and a strong undercurrent of bird protection running through it all. The book will attract many, especially children, and doubtless win many to the cause of the birds. Ornithologists are scored for the killing of birds for any purpose whatever. The obtaining of 271 stomachs of birds for scientific analysis of their food habits is characterized as a "successful drive upon the part of the Allies—Scientists, Plume Hunters and Curators," and the statement follows "back of much of the so-called scientific examination

¹ The Birds of Southern Nigeria. Including a detailed review of the races of species known to occur there. By David A. Bannerman, M. B. E., B. A., M. B. O. U., F. R. G. S.; C. F. A. O. U. (British Museum, Natural History). With Notes on the Topography of the Country—By Robin Kemp and Willoughby P. Lowe, M. B. O. U. *Revue Zoologique Africaine*. IX, Fasc. 3. pp. 254-426. 1921.

² A Practical Handbook of British Birds. Edited by H. F. Witherby. H. F. and G. Witherby, 326, High Holborn, London, W. C. 1. Pt. XIII. (Vol. II, pp. 353-448. February 16, 1922.

³ What Birds Have Done With Me. By Victor Kutchin, M. D., A Bird Lover. Boston, Richard G. Badger. The Gorham Press. 1922. pp. 1-274. Frontispiece portrait of the author. Price \$2.00 net.

of birds' stomachs is the commercial demand for a stuffed specimen." Such statements only serve to illustrate the author's unfamiliarity with this side of his subject. We could never have secured adequate laws for the protection of our birds had we not been able to meet the hard-headed legislators with just the scientific facts that the author criticises, and those laws as he ought to know have stopped the commercializing of stuffed specimens.—W. S.

Recent Papers by Riley.—Mr. J. H. Riley has recently described¹ *Dryonastes grahami* (p. 59) from Szechuan, China, and proposed² a new genus *Orospingus* (p. 61) for *Chlorospingus goeringi* ScL. and Salv. He has also pointed out³ that *Noddi* Desmurs 1847 is the first tenable name for the Inca Tern, that *Grammopsittaca lineola maculata* Ridgway really came from Venezuela and should be called *tigrinus* Souancé⁴, and that *Anas arcuata* Horsfield is still available for the Tree Duck⁴ to which it has usually been applied, although without consulting all the references it is difficult to follow Mr. Riley's rather involved explanation.³—W. S.

Check List of the Birds of Essex County, Mass.⁵—It is only proper that such an active organization as the Essex County Club should want a field check list of its own and the present little pocket list is the result. It is astonishing to see how many different field check lists there are, and nearly everyone has personal preferences and likewise finds points to criticise in the lists of others.

In the present list we find that with names and dates, etc., all in heavy faced type and printed close together, it is extremely difficult for the eye to separate them and almost impossible for it to carry across to the proper line on the opposite blank page. The probability of getting one's notes opposite the wrong species is so great as to constitute a serious danger. The printing and character of the data, are however, excellent.—W. S.

McGregor and Marshall on Philippine Birds for Boys and Girls.⁶—We are constantly astonished at the spread of the interest in popular bird study but nothing in recent literature has emphasized this fact more

¹ Proc. Biol. Soc. Washington, p. 59.

² Ibid. p. 61.

³ Ibid. p. 77.

⁴ Ibid. p. 78.

⁵ Check List of the Birds of Essex County, Massachusetts April, 1922. (12 pp. of list and 12 blank for notes). To be had from the Secretary, 88 Washington Square, Salem, Mass.

⁶ Philippine Birds for Boys and Girls. By Richard C. McGregor and Elizabeth J. Marshall with illustrations by Macario Ligaya. Manila. Bureau of Printing 1922. pp. 1-138.

strikingly than the appearance of a Philippine bird book for boys and girls with a diagram of a Hornbill on the cover and colored plates and cuts of various species by a native artist, Macario Ligaya!

The text by R. C. McGregor and Elizabeth J. Marshall is printed in extra large type and is very popular and conversational in character to attract the attention of the young reader, but it carries nevertheless reliable information on the habits of the species and a plea for their protection.

A list of the thirty species considered is given at the end with their technical names and some further information, while there is also a list of bird books relating to Philippine ornithology.—W. S.

The Provencher Society of Natural History of Canada.¹—Under this title appears a pamphlet describing the incorporation and objects of the Society i., e., the study and conservation of the wild life of Canada. There are also articles on sanctuaries, game, fish, and various birds; and poems, some original and some reprinted. The illustrations are numerous and varied, with many excellent little color sketches of birds by F. C. Hennessy. A curious feature of the book is that upon turning it over vertically and opening what was the back cover we have all the matter relative to the society and its objects reproduced in French but with different supplementary matter and different illustrations, thus cleverly meeting the difficulties presented in a country where the public which it is desired to reach speak some one language, some the other.—W. S.

Todd on the Genus *Myiobius*.²—This is a very careful review of a difficult group, of which Mr. Todd recognizes seven species and four additional races. Only one of these, *M. villosus peruvianus* (p. 32) Rio Tavera, Peru, is new. Mr. Todd comments upon the danger of hastily relegating similar forms inhabiting adjacent geographic areas to the category of subspecies, as many so treated, especially in the Tyrannidae, have ultimately proven perfectly distinct species.—W. S.

Misses Baxter and Rintoul on some Scottish Breeding Ducks.³—This little work presents an historical record of the nestings of a number of species of ducks in Scotland with detailed accounts of the character of their occurrence in the several counties and abundant references to sources of information. The species considered are the Gadwall, Wigeon, Shoveller, Pintail, Pochard, Eider, Common Scoter, Goosander and Red-breasted

¹ Secretary of Society Jos. Matte, Roads Dept. Prov. of Quebec, P. Q.

² Studies in the Tyrannidae. II. The Restricted Genus *Myiobius*. By W. E. Clyde Todd. Proc. Biol. Soc., Washington. 35, pp. 17-38. March 20, 1922.

³ Some Scottish Breeding Duck. Their Arrival and Dispersal. By Evelyn V. Baxter and Leonora Jeffrey Rintoul. Edinburgh. Oliver and Boyd, Tweeddale Court, 1922. pp. 1-90. price 5s. net.

Merganser and there is a final chapter on conclusions in the matter of the extension of the breeding range in ducks.

Four of the chapters have already appeared in 'British Birds' but the others are here published for the first time. The work forms a valuable contribution to our knowledge of the Anatidae.—W. S.

Chapman on South American Birds.—In a paper on the genus *Pygochelidon*,¹ Dr. Chapman recognizes *P. cyanoleuca* of rather wide range in the mountains, *P. patagonica patagonica* of the South Temperate zone, *P. p. peruviana* (p. 7) a new race from Peru, and *P. flavipes* (p. 8) a very distinct species represented by one specimen from Prov. Juvien, Peru. Interesting comments on the probable origin and distribution of the forms follow. In another contribution² Dr. Chapman describes eight new races and species from Colombia, Ecuador and Argentina including *Jacana scapularis* (p. 3) from western Ecuador, the first record of the genus from west of the Andes.—W. S.

Wetmore and Peters on New American Birds.³—*Teledromas* (p. 41) is proposed for *Rhinocrypta fusca* Scl. and Salv. *Dendrocygna bicolor helva* (p. 42), San Diego Co., Calif., is described as new, the North American bird proving to be separable from true *bicolor* of Paraguay. *Colaptes pitius cachinnans*, (p. 43) Argentina, is proposed as new and the genera *Pituipicus* and *Soroplex* are merged in *Colaptes*. *Brachyspiza capensis choraules* (p. 44), Rio Negro and *Saltator aurantiirostris nasica* (p. 45) Mendoza, Argentina, are described, and Dr. Wetmore independently describes *B. c. mellea* (p. 39) from Paraguay⁴ and three new forms of Tinamou;⁵ *Rhynchotus arcanus* (p. 434). Parana, Argentina; *Nothura maculosa savannarum* (p. 435) Rocha, Uruguay; and *Calopezus elegans albidus* (p. 437), San Juan, Argentina.—W. S.

Bangs on Philippine Birds.⁶—This paper consists of comments on eight species and descriptions of five new forms all from extensive collections presented to the Museum of Comparative Zoology by Governor General Forbes. The new races are *Lalage niger mitifica* (p. 80) Lubang; *Aegithina*

¹ The Distribution of the Swallows of the Genus *Pygochelidon*. By Frank M. Chapman. Amer. Mus. Nov., No. 30, February 28, 1922, pp. 1-15.

² Descriptions of Apparently New Birds from Colombia, Ecuador, and Argentina. By Frank M. Chapman. March 2, 1922.

³ A New Genus and Four New Subspecies of American Birds. By Alexander Wetmore and James L. Peters. Proc. Biol. Soc., Wash., 35. pp. 41-46. March 20, 1922.

⁴ Description of a *Brachyspiza* from the Chaco of Argentina and Paraguay. *Ibid.* pp. 39-40, March 20, 1922.

⁵ Three new Birds of the Family Tinamidae. By Alexander Wetmore. Jour. Wash. Acad. Sci., 11, No. 18, Nov. 4, 1921.

⁶ Notes on Philippine Birds Collected by Governor W. Cameron Forbes. Bull. Mus. Comp. Zool. LXV., No. 4. April, 1922, pp. 77-84.

tiphia aequanimis (p. 81) Palawan; *Orthotomus ruficeps nuntius* (p. 82) Sulu Archipelago; *Zosterops forbesi* (p. 83) Camiguin and *Oriolus xanthotus persuasus* (p. 83) Palawan.—W. S.

Palmer on Game as a National Resource.¹—In this report Dr. Palmer has presented a mass of information that is essential to the proper understanding of the game problem, and those interested in legislation, game reservations private or public, and the ethics of hunting, will find it invaluable as a work of reference. The principal kinds of game in the United States are first briefly considered, then the value of game from various points of view, and methods of increasing and maintaining the game resources.

Under the head of "value of game," the possibilities of game raising by farmers and the leasing of hunting privileges are considered as a means of profit and also the importance of hunting as an antidote for excessive brain work. In attempting to estimate game values in dollars and cents we learn that under normal conditions there are probably five million hunters in the United States and license fees for hunting should total nearly five million dollars, while New York alone estimates the value of its game supply at fifty-three million dollars. Interesting maps show the character of hunting restrictions in the various states, while the records of game killed show some surprising figures. In Pennsylvania it is stated that in 1919, 287,001 Ruffed Grouse, 5,181 Wild Turkeys, 46,319 Bobwhites, 27,769 Woodcock and 28,714 wild water-fowl were killed! In New York in 1918, 41,757 Ruffed Grouse, 8,999 Bobwhites, 19,249 Woodcock, and 114,643 wild water-fowl and in Minnesota in both 1919 and 1920 over two million game birds of various kinds were killed.

It is hard to understand the discrepancies in some of these figures while the Wild Turkey figures for Pennsylvania are surprising.

Space prohibits further quotations from Dr. Palmer's report but everyone interested in the game problem should read it carefully.—W. S.

Hewitt's 'The Conservation of the Wild Life of Canada.'¹—This is a posthumous volume, the work of the brilliant Dominion Entomologist who for ten years so ably conducted the entomological service of Canada and did so much along the broader lines of conservation of wild life, and whose premature death in 1920 has already been recorded in these pages.

The admirable manuscript that he left behind on wild life conservation which is now published, covers the subject in a most satisfactory way, and while chiefly interesting to Canadians may be read with profit by everyone interested in conservation, and will prove a standard work of reference.

¹ Game as a National Resource. By T. S. Palmer. Expert in Game Conservation. U. S. Dept. Agr. Bulletin 1049. March 14, 1922. pp. 1-48.

¹ The Conservation of the Wild Life of Canada. By C. Gordon Hewitt, D. Sc., Dominion Entomologist and Consulting Zoologist. With numerous illustrations. New York, Charles Scribner's Sons. 1921. pp. 1-344.

As is natural, much of the volume relates to mammals and to game legislation, the chapters concerned more especially with birds being: "The Extermination of Wild Life," "The Game Birds and Larger Non-Game Birds of Canada," "Birds in Relation to Agriculture," and "Government Reserves for the Protection of Birds." The usual information with reference to attracting birds and providing nest boxes, etc., is clearly set forth, and brief accounts of the present and past abundance of the game birds, their habits, etc., are presented. In this connection we note that the author is satisfied that man's slaughter of the Passenger Pigeon and Great Auk was sufficient to account for their extermination, without resorting to fanciful theories.

Some "bird counts" by Mr. N. Criddle which are presented are interesting for comparison with similar counts at localities in the United States. An area of 76 acres, chiefly prairie, contained in three years 58, 72 and 74 pairs of breeding birds respectively, of from 21 to 27 species, while an area of 26 acres of woodland contained in the same years 65, 72 and 66 pairs, of 28 to 31 species. All in all Dr. Hewitt's work will present in concise form to all Canadians the same sort of information that the Biological Survey furnishes, in its bulletins, to the residents of the United States and is a most welcome contribution to the literature of conservation.—W. S.

Hartert's 'Die Vögel der palaarktischen Fauna.'—Three parts of this work reached this country during February last. No. XV (Bd. III, 1), covers the Alcidae, Otididae, Gruidae, Rallidae and Tetraonidae. No. XVI (Bd. III, 2) treats of the Phasianidae and begins the additions and corrections which are continued in No. XVII (Bd. III, 3). This famous publication is thus rapidly approaching completion.—W. S.

Food Habits of Two Owls in Britain.—Like all previous studies that¹ of Dr. W. E. Collinge reveals a preponderance of good over harm in the feeding habits of the Barn Owl. Mice and voles constitute nearly 70 per cent of the food and injurious insects and birds (House Sparrow, Starling, and Blackbird) together, an additional 18 per cent. Shrews, miscellaneous small birds, and neutral insects compose the remainder of the diet.

The Little Owl (*Carine noctua*), a bird introduced in to the British Isles and now common, also is reported² upon by Dr. Collinge. Game-keepers and poultry-raisers have condemned the species and have destroyed large numbers of the birds as "vermin." The present study of its food habits is based on the examination of 212 stomachs and 260 pellets, besides various lots of material brought to the nests. It was found that

¹Berlin, R. Friedlander & Lohn.

²The Barn-owl. Journ. Ministry Agr. 28, No. 10, 1922, pp. 1-4.

³The Food and feeding habits of the Little Owl, *ibid.*, Nos. 11-12, Feb.-March, 1922, pp. 1-17.

voles and mice make up 31 per cent of the food, injurious insects, 30 per cent, neutral insects 17 per cent, earthworms 7 per cent and wild birds 4 per cent. The latter, in this case also, were chiefly injurious species. Game birds were barely represented and poultry not at all. Consequently Dr. Collinge's judgment is distinctly favorable to the Little Owl.—W. L. M.

Bird Enemies of Two Exotic Insect Pests.—The wattle bagworm (*Acanthopsyche junodi*) is termed the worst of pests of the black wattle in South Africa. From a study of nearly 60,000 specimens it has been determined that birds destroy about one per cent of these insects. The birds that have been observed to prey upon the bagworm are Sprews, Parrots, Weaver-birds, Silver-eyes and Butcher-birds¹.

In Trinidad a blight both directly and indirectly due to the sugar-cane frog hopper (*Tomaspis saccharina*) is the most serious drawback to cane-growing which ranks second among the industries of the island. Damage as high as £300,000 has been caused by this blight in a single year. In an extensive account² of the natural enemies of the frog hopper Mr. C. B. Williams records 3 species of birds as preying upon the immature insects and 17 upon the adults. The Forked-tailed Flycatcher (*Muscivora tyrannus*) is said to be the most important bird enemy of the frog hopper.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXIV, No. 2. March-April, 1922.

When the Birds Come North. By Grace A. Hill.—An account of the spring migration 30 miles north of Nome, Alaska.

The Friendly Phoebe. By Clinton G. Abbott.—Illustrated account of a nesting.

Caught in a Springtime Blizzard. By Margaret A. Bartlett.—At Boulder, Colo.

A Nest-Building Parrot. By Mary B. Sherman.—An escaped pair of Gray-breasted Parakeets built in a garden at Ogdensburg, N. Y.

The Migration and Plumage papers cover the Red-winged Blackbirds with a plate by Fuertes.

The Condor. XXIV, No. 2. March-April, 1922.

A Large Tern Colony in Texas. By J. R. Pemberton.—Well illustrated.

Notes on Fox Sparrows in California in the Autumn of 1921. By Joseph Mailliard.

A Study of Roosting Holes of the Red-shafted Flicker. By Emerson A. Stoner.—Drilled through the sides of a frame building and roosted inside.

A Law Governing the Elevation of the Nesting Site. By Charles K. Averill.—"Birds with long pointed wings may nest high or low, but the short and round winged are low nesting."

¹Skaife, S. H., South African Journ. Sci., 17, Nos. 3-4, July 1921, pp. 291-301.

²Mem. Dept. Agr. Trinidad and Tobago, No. 1, Jan. 1921, pp. 66-67, and 70-78.

The Wilson Bulletin. XXXIV, No. 1. March, 1922.

Notes on the Road-Runner at Fort Worth, Texas. By George M. Sutton.
—An elaborate study of the bird's habits illustrated with drawings by the author.

Florida Burrowing Owl. By C. J. Pennock.—A study of the species on the plains near Punta Gorda, Fla. The writer considers the birds are decreasing.

The Birds of the Cape Fear Region of the North Carolina Coast. By Z. P. Metcalf.—A briefly annotated list.

The Oölogist. XXXIX, No. 2. February, 1922.

Winter Observations in Texas. By James Wood.—From vicinity of Brownwood.

The Blue Grosbeak in Tarrant County, Texas. By Ramon Graham.

The Oölogist. XXXIX, No. 3. March, 1922.

American White Pelican at Malheur Lake, Oregon. By A. G. Prill.—Well illustrated.

The Oölogist. XXXIX, No. 4. April, 1922.

Some notes on the Light-footed Rail (*Rallus levipes*). By H. A. Edwards.

Birds observed at East Leake, Goochland County, Va. By Robert W. Williams.

The Ibis. (11 series) IV, No. 2. April, 1922.

On the Sense of Smell possessed by Birds. By J. H. Gurney.—An elaborate consideration of published data pro and con but no definite conclusion as to whether birds have a well marked sense of smell. As several times mentioned in 'The Auk' there is a deplorable lack of careful field experiments and many of the recorded observations are by no means convincing. In fact some accepted as important by Mr. Gurney are wholly rejected by Dr. R. M. Strong in his discussion of the subject. (Jour. Morph. XXII, pp. 619-660.)

Notes on the Nest and Eggs of *Stenostira scita* (Vieill.) By H. W. James.

On the Eggs of the Puffin (*Fratercula arctica*). By Percy F. Bunyard.—These eggs are usually heavily blotched but the color is deep-seated and covered by superficial coats of lime. Interesting photographs of eggs illuminated by electric light from within clearly show the striking markings.

The Birds of Jhang District, S. W. Punjab. Part I. Passerine Birds. By Hugh Whistler.—A well annotated list with an introduction dealing with the physical features of the district.

Remarks on the Japanese Petrels of the Genus *Oceanodroma*. By N. Kuroda.—*Oceanodroma melania matsudariae* (p. 311), Coast of Japan, is described as new, and should, we think, have been spelled *matsudairae*.

Modern Nomenclature and Subspecies. By H. J. Elwes.—A long commentary on the evils of adopting the tenth edition of Linnaeus, and the

establishment of subspecies, modern rules of nomenclature, and the changes which they have, brought about in bird names; but no remedy is offered nor antidote suggested!

Results of a Collecting Trip in the Cantabrian Mountains, northern Spain. By H. F. Witherby.—A well annotated list with an itinerary, description of the country, comparative lists for the Pyrenees, Cantabrians, N. Portugal and the Algeciras and a discussion of the humidity.

Beginning with this issue 'The Ibis' will publish a brief list of papers in the current ornithological journals, following the plan established by 'The Auk' some ten years ago.

Bulletin British Ornithologists' Club. CCLXIV.

Mr. Sclater communicates nomenclatural notes on African Hornbills and Kingfishers and proposes *Bycanistas sharpii duboisi* (p. 45) as new, from Cameroon. Mr. H. F. Witherby describes *Dryobates medius lilianae* (p. 49) from N. W. Spain. Dr. Hartert presents several new forms from Africa and Mr. La Touche a number from Yunnan.

Bulletin British Ornithologists' Club. CCLXV. February 2, 1922.

W. L. Sclater presents a synopsis of *Indicator variegatus* and its allies and the races of *Tricholaema hirsutum*. He also presents as new *T. leucomelan namaqua* (p. 63) Namaqualand; and *Micropus caffer ansorgei* (p. 63) northern Angola.

Mr. Kirke Swann presents an account of his recent visit to America and examination of the Accipitres in the several museums. In this connection he describes *Falco columbarius bendirei* (p. 66) Walla Walla, Wash., type in the Mus. Comp. Zool., and *F. rusticolus alascanus* (p. 67) Norton Bay, Alaska, type in U. S. Nat. Mus. He regards *F. obsoletus* a mere melanistic form of *F. candicans* thus reducing the North American races to two.

Mr. Bannerman describes *Fraseria ocreata kelsalli* (p. 68) Sierra Leone, and *F. cinerascens guineae* (p. 69) Portuguese Guinea, as new.

Mr. Meade-Waldo describes the curious habit of the male Sand Grouse of saturating its ruffled breast plumage with water and carrying it in this way to the young.

Bulletin British Ornithologists' Club. CCLXVI. February 25, 1922.

Mr. W. L. Sclater shows that the generic name *Pteroclorus* is a synonym of *Pterocles* both applying to the long-tailed Sand Grouse and proposes *Eremialector* (p. 74) for the short-tailed species, type *Tetrao orientalis* Linn. (= *Pterocles arenarius* (Pall).)

Three other new genera are proposed, *Stephanoaëtus* (p. 75), type *Falco cornatus* L., *Cassinaëtus* (p. 76), type, *Limnaëtus africanus* Cassin, and *Tropicranus* (p. 76) for *Ortholophus* O. Grant, preoccupied. *Pterocles burchelli* (p. 74) is proposed for *P. variegatus*, preoccupied.

An account of the eleventh oölogical dinner follows with a list of specimens exhibited.

Bulletin British Ornithologists' Club. CCLXVII. March 13, 1922.

Rothschild and Hartert propose as new *Tanysiptera danae intensa* (p. 91) S. E. New Guinea.

Mr. Stuart Baker presents a valuable paper on "Cuckoos,—Some theories about the birds and their eggs." (see antea p. 433).

Bulletin British Ornithologists' Club. CCLXVIII. May 5, 1922.

Decision is reached not to publish proceedings of the oölogical dinners which are not under the auspices of the Club and have been criticized because of the large number of eggs exhibited and the inconsistency of excessive collecting with bird protection. The Club goes on record as opposed to "collecting eggs in unnecessary numbers" or "taking the eggs of any birds in localities where they are rare."

W. L. Selater continues his comments on nomenclature and taxonomy of African birds.

C. B. Ticehurst describes three new Indian birds and D. A. Bannerman, *Galerida cristata whitakeri* (p. 124) from Tunisia and J. D. LaTouche, *Pericrocotus montpellierieri* (p. 125) from Yunnan.

British Birds. XV, No. 10. March, 1922.

Observations on the Breeding Habits of the Merlin. By W. Rowan.—Rearing of the Young (continued in April).

The "British Birds" Marking Scheme. Progress for 1921. By H. F. Witherby.

British Birds. XV, No. 11. April, 1922.

History of the Great Crested Grebe in Dumbartoushire. By Alex. Cuthbertson.

Some Breeding Habits of the Sparrow Hawk. By J. H. Owen.—Part IV.

Notes on the Breeding Habits of the Wood Lark in Dorset. By W. J. Ashford.

British Birds. XV, No. 12. May, 1922.

Ornithological Notes from Norfolk for 1921. 28th Annual Report. By J. H. Gurney.

There is an interesting letter from B. B. Riviere giving the velocity of flight of Homing Pigeons in recent flights, ranging from 52 to 82 miles per hour for distances up to 600 miles.

Avicultural Magazine. XIII, No. 1. January, 1922.

The Proposed New Bill for the Protection of Wild Birds by R. I. Pocock.—Well worthy of study by American bird protectionists.

The Breeding of Gang-Gang Cockatoos. By F. G. Hedges.

Avicultural Magazine. XIII, No. 2. February, 1922.

Aviculture in Japan. By N. Taka-Tsukasa.—Extends back 1700 years (continued in March and April issues.)

Avicultural Magazine. XIII, No. 4. April, 1922.

About Birds in North America. By F. E. Blaauw.—A better account of our birds than most of our foreign visitors write, although New York ornithologists will doubtless be surprised at the occurrence of "*Ceryle torquata*" flying overhead near the "Broadpark" Zoo!

Color Change in Golden Plover. By Hugh Wormald.—Is "well aware that Zoologists deny the possibility of color change in old feathers" and makes "no pretense at being scientific" but is satisfied "that not only is it possible but frequently occurs" and *knows* that a Snipe he once kept did so change. Such assertions do not get us very far!

The Emu. XXI, Part 3. January, 1922.

Black-throated Ground-Bird. *Cinclosoma alisteri* (Mathews). By A. J. Campbell.—With colored plate.

Two New Subspecies of Birds. By H. L. White.—*Gymnorhina tibicen eylandtensis* (p. 163); *Geophaps scripta peninsulæ* (p. 163) from North Territory and North Queensland, respectively.

Notes from the Nullarbor Plain. By F. L. Whitlock.—With several photographs of nests including woodpecker-like holes of the new Naretha Parrot.

Some Birds of Groote Eylandt, Northern Territory. By A. J. Campbell.

Types of the Australasian Genera of Penguins. By R. Stuart-Sutherland.

An Impression of the Birds of Australia. By A. H. Wilson. A visiting ornithologist from Great Britain.—Saw 41 species in three hours time and could have added 11 others had a certain swampy spot been visited. "This is a more fruitful walk (aided by a car) than I think any non-tropical country in the world could rival." But the author is probably unacquainted with the daily lists to be made in almost any part of the eastern United States.

Notes on Petrels washed ashore, West Coast, Auckland Province, N. Z. By R. A. Falls.

The Annual Congress and Camp-out of the R. A. O. U.

Some Remarks on Re-naming Birds and the Rules of Zoological Nomenclature. By A. J. Campbell.—Another protest against "bed-rock priority" and methods of type-fixation which cause changes in familiar names, but no remedy is offered. The author seems unaware that the use of the word "indication" in Art 21 of the International Code has been fully explained and discussed (Science, July 5, 1907, etc).

The Emu. XXI, Part 4. April, 1922.

The Lyre-Bird, *Menura novae-hollandiae* Latham. By A. J. Campbell.—With colored plate of *M. n. edwardi*.

Prince Edward's Lyre-Bird at Home. By Spencer Roberts.—Photographs of nests.

The Dusky Miner (*Myzantha obscura* Garld). By Edwin Ashby.

Observations and Records of Australian Sea-Birds, 1920-1. By W. B. Alexander.

Papua—The Land of Birds. By A. H. Wilson.

A visit to the Archipelago of the Recherche, S. W., Australia. By A. F. Bassett-Hull.—Consists of an interesting narrative and a list of 24 species.

Birds Observed near Wellington, N. Z., By R. H. D. Stidolph.

On the Skeleton of the Wedge-tailed Eagle (*Uroaetus audax* Latham). By R. W. Shufeldt.

The Austral Avian Record. IV, No. 7. March 7, 1922.

Additions and Corrections to my Check List, 1920. By G. M. Mathews.

An extraordinary Bird Book. By G. M. Mathews and Tom Iredale.—James Jennings' "Ornithologia or the Birds; a Poem in two parts, 1828." A prose supplement contains some new names most or all of which are untenable. Mathews proposes *Dromaius n. gunni* (p. 175) for the bird figured on Pl. 2, Vol. I of his 'Birds of Australia.'

Captain Thomas Brown, Ornithologist. By G. M. Mathews and Tom Iredale.—A review of the publications of this erratic writer.

The South Australian Ornithologist. VI, Part 5.

A Trip to North-West Australia. By A. M. Morgan.

Notes on Birds seen during a Visit to the Western Darling. By A. Chenery.

Revue Francaise d'Ornithologie. XIV, No. 154. February, 1922. [In French.]

Description of a New Mediterranean Species of Falco. By L. Lavendon. *F. blancheti* (p. 212) Sfax, Tunisia (continued in March issue).

L'Oiseau. III, No. 1. January, 1922. [In French.]

The Bronze Starling, *Lamprocorax metallica* (Temm.). By J. Delacour
Parroquets of the Group *Platyceus*. By J. Berlioz.

A Nesting of the Cardinal. By A. Decoux.—Regrets that owing to the protecting laws it is impossible to procure Cardinals from the United States and all that reach France are the smaller less hardy Mexican forms.

L'Oiseau. III, No. 3. March, 1922. [In French.]

Experiences of a Naturalist in French West Africa. By Dr. Millet-Horsin.

Ornithologische Beobachter. XIX, Heft 5. February, 1922. [In German.]

The Little Bittern. By H. Noll-Tobler.—With photographic illustrations of nest and young.

Ornithologische Beobachter. XIX, Heft 7. April, 1922. [In German.]

The Moor-hen (*Gallinula chloropus* L.) By A. Schifferli.

Journal für Ornithologie. 70, No. 1. January, 1922. [In German.]

Review of Saxon Ornithology. By R. Heyder.

On the Avifauna of northern German-Southwest Africa. By H. Grote.

—New forms described: *Eupodotis afroides etoschae* (p. 42); *Dendropicos guineensis stresemanni* (p. 43); *Philetairus socius geminus* (p. 45); *Mirafra sabota waibeli* (p. 46).

On the Invasion of Waxwings in 1920-21. By Tschusi zu Schmidhoffen.

Yearly Review of Bird Observations at Rossitten, (1920). By J. Thiene-mann.

The Macedonian Bird-fauna. By O. Fehringer.

El Hornero. II, No. 4. April, 1922. [In Spanish.]

The Petrels and Albatrosses of the South Atlantic. By R. Dabbene.

Notes on Subantarctic Birds. By A. G. Bennett.

List of Birds Collected and Observed in Rosas. By Juan B. Daguerre.

—An annotated list of 155 species.

Capture of the Albatross, *Thalassogeron eximius* Verrill in the Province of Buenos Aires. By R. Dabbene.

Birds in South American Folk Lore. By R. Lehmann-Nitsche.

The first Instalment of a Bibliography of Ornithology for 1921, by Hans Secht appears in this issue.

Tori. III. No. 12 and 13. March, 1922. [In Japanese.]

A New Genus proposed for the Mikado Pheasant. By N. Takatsukasa and N. Kuroda.—*Neocalophasis*.

On the Moulting of Gulls. By Y. Matsudaira.

Birds of Shizunra, Suruga. By N. Kuroda.

On *Chaunoproctus ferreirostris*. By M. Hackisuka.

Notes on Some Birds from Hachyo Island. By T. Momiyama.

Method of Flight of *Aquila chrysaetos*. By Y. Enomoto.

Birds from Shikoku. By M. Fujita.

Anomalies of egg-marking. By J. Nibe.

Catharacta matsudairae is described as a new species by N. Takatsukasa.

Ornithological Articles in Other Journals.

Murphy R. C. The Seacoast and Islands of Peru.—IX. (Brooklyn Museum Quarterly, April, 1922)—The Pescadores and Guafñape Isles and their bird-life.

O'Donoghue, C. H. A Preliminary Survey of the Biota of a Sand Spit in Lake Winnipeg. (Canadian Field Naturalist, Oct.—Dec., 1921.) —36 species of birds.

¹ Some of these journals are received in exchange others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

- Criddle, N.** Birds that are Little Known in Manitoba. (Ibid.)
- Taverner, P. A.** Lessons Learned from a Tame Sparrow Hawk. (Ibid.)
- Monro, J. A.** The Band-tailed Pigeon in British Columbia. (Ibid., Jan. 1922.)
- Monro, J. A.** A Proposed Bird Sanctuary in British Columbia. (Ibid., Feb. 1922)—Swan Lake.
- Monro, J. A.** The "Japanese Starling" in Vancouver, British Columbia. (Ibid.)—*Acridotheres cristatellus* introduced and spreading.
- E. Beaupre.** The Duck Hawk. (Ibid.)
- Townsend, C. W.** The Summer Birds of Advocate, Cumberland County, Nova Scotia. (Ibid., March, 1922)—81 species.
- Williams, M. Y.** Biological Notes along Fourteen Hundred Miles of the Mackenzie River System. (Ibid., April, 1922)—A good list of birds.
- Smith, F. Napier.** The American Hawk Owl. (Ibid.)
- Taverner, P. A.** The Disappearance and Recovery of the Eastern Bluebird. (Ibid.)
- Farley, F. M.** Summer Birds of the Lac La Biche and Fort McMurray Region (Ibid.)—List of 89 species.
- Taverner, P. A.** Adventures with the Canadian Goose. (Ibid., May 1922.)
- Monro, J. A.** Notes on the Water Birds of Lake Newell, Alberta. (Ibid.)
- Wait, W. E.** Passerine Birds of Ceylon. (*Spolia Zeylanica*, XII, pt. 45, pp. 22-194.)
- Coopman, L.** Nests of the Marsh-hen (*Gallinula chloropus*). (*La Nature*, 1922, No. 2509.) [In French.]

Additional Publications Received.

- Alabama** Bird Day Book.
- Arbor Day and Bird Day.** Penna. Dept. Publ. Instr.
- Forbes, S. A.** and Gross A. O. The Numbers and Local Distribution in Summer of Illinois Land Birds of the Open Country (*Bull. Ill. Nat. Hist. Survey*, XIV, Art. VI, April 1922.)
- Forbes, S. A.** and Gross, A. O. Orchard birds of an Illinois Summer. (Ibid. Art. I, January 1922.)
- Kuroda, N.** On a collection of Birds from Hainan (*Dobulsugaku Zasshu*) 1921.
- Lucanus, T. von.** Die Ratsel des Vogelzuges. H. Beyer and Sohne, Berlin.
- Mathews, Gregory M.** The birds of Australia, IX, No. 8, May 22, 1922.
- Shufeldt, R. W.** (1) Our Gannets (*Amer. Forestry*, Dec. 1921). (2) Summer Birds and Flowers (Ibid., May 1922).
- Wetmore, Alexander.** Bird Remains from the Caves of Porto Rico. (*Bull. Am. Mus. Nat. Hist.*, XLVI, Art. III, May 1922.)
- Academy of Nat. Sci. of Phila.** Proceedings, LXXIII, Pts. II and III.

- Audubon** Bulletin. Illinois Audubon Society. Spring 1922.
Avicultural Magazine, XIII, No. 5. May 1922.
Austral Avian Record, IV, No. 8.
Bird-Lore. May-June, 1922.
Bird Notes and News. IX, No. 8, X, No. 1.
Bulletin American Game Protective Association, II, 2. April 1922.
Bulletin British Ornithologists' Club. CCLXIX. May 20, 1922.
Bulletin Charleston Museum, XVII, No. 3. May, 1922.
California Fish and Game. VII, No. 4, VIII. Nos 1 and 2.
Canadian Field Naturalist. Oct.-Dec., 1921 to May, 1922.
Club Van Nederlandsche Vogelkundigen, 12, Afl. 1, 1922.
Fins, Feathers and Fur. December 1921 and March, 1922.
Natural History. January-February 1922.
New Jersey Audubon Bulletin, No. 30. April, 1922.
Oölogist, The. May, 1922.
Ornithologische Beobachter. March, 1922.
Philippine Journal of Science. XIX, Nos. 1 to 6 and XX, No. 1 and 19th Annual Report of the Bureau of Science.
Proceedings and Transactions of the Nova Scotia Institute of Science, XV, Part 1.
Revue Francaise d'Ornithologie. No. 157, May, 1922.
Science Nos. 1417-1433, February 24-June 16, 1922.
Scottish Naturalist, The. No. 123-124 March-April, 1922.
South Australian Ornithologist. VI, No. 6, April, 1922.

NOTES AND NEWS

GEORGE SPENCER MORRIS, a member of the American Ornithologists' Union, died at his home "Birdfield," Olney, Philadelphia, on April 12, 1922, in the fifty-fifth year of his age. He had been in poor health for the past few years and had spent the last two winters at Miami, Fla. His friends, however, had no realization of the seriousness of his condition and his death came as a great shock.

Mr. Morris belonged to one of the oldest families of Philadelphia, identified prominently with the public affairs of the city from the time of William Penn and with the activities of the religious Society of Friends of which they were members. He was born at Olney on July 11, 1867, the son of Samuel Morris, a noted minister in the Society of Friends, and Lydia Spencer Morris, a relative of Edward Harris, the friend of Audubon. He was educated at Westtown, the famous Quaker Boarding School, which John Cassin, John K. Townsend and many other Pennsylvania naturalists had attended. Upon leaving school he became an architectural draughtsman and later established an architectural business

of his own in partnership first with Wm. S. Vaux, Jr., and later with Richard Erskine.

From early youth Mr. Morris had been deeply interested in ornithology and Audubon, from whose works he gained his first knowledge of the subject, was his ideal. Doubtless the artistic ability of the great ornithologist attracted him quite as much as his knowledge of birds, for Morris himself possessed talents in this field and became a landscape artist of ability both in oils and water colors, and was an active member as well as Vice President of the Philadelphia Sketch Club.

In 1890 he was one of the group of young men who founded the Delaware Valley Ornithological Club and were responsible for the revival of ornithological interest at the Philadelphia Academy. He served as Secretary and President of the Club, and as Councillor and Curator of the Academy, as well as Vice-Director of the Ornithological Section and member of the Lecture Committee. He became an Associate of the American Ornithologist's Union in 1887 and a Member in 1903. He was active on the Committee of Arrangements for all the Philadelphia meetings and often attended the sessions in Washington and New York, taking a deep interest in the work of the Union.

In the winter of 1889-90 he made an ornithological trip to Tampa Bay, Florida, and in 1892, accompanied Samuel N. Rhoads, a cousin by marriage, on an expedition to Puget Sound and British Columbia, but most of his bird study was carried on along the Atlantic Coast, especially at Cape Charles, Va., and Beach Haven, N. J., and in the vicinity of Philadelphia. In 1895 he visited Europe. In the same year he married Miss Lydia Ellicott, who with five children survives him.

Mr. Morris wrote well and could picture nature as skillfully with the pen as with the brush, but unfortunately he published but little, his contributions appearing mainly in 'Cassinia,' the annual of the Delaware Valley Club, in the maintenance of which he was deeply interested. A paper based on letters of Edward Harris appeared in 'The Auk' for 1895 and he contributed 'A Flood-water Cruise through a Cypress Swamp' to 'Recreation' for April 1910, and similar outdoor sketches to various smaller literary journals.

He was fond of all kinds of out door diversions, hunting, fishing, etc., but it was the beautiful in nature that most appealed to him. He enjoyed to the full canoeing trips down the wilder, less-known streams of the East, trout fishing in the roaring mountain brooks and camping in the level pine barrens of New Jersey, seeing everything with the eye of the artist as well as of the ornithologist. He was interested in all movements for social betterment, especially as they concerned boys and their interests and was a director of the Philadelphia Boy Scouts.

He had a most attractive personality, always cordial and generous, yet quiet and unassuming, earnest and helpful in every undertaking

with which he was identified and a valued friend in the truest sense of that word.—W. S.

ALFRED GRANDIDIER, of Paris, a Corresponding Fellow of the American Ornithologists' Union since 1883, and a member of the French Academy of Sciences, died Sept. 13, 1921, in the 86th year of his age. He was born Dec. 20, 1836, and was educated privately. At the age of twenty in company with his brother Ernest and in charge of M. Janssen he started on a trip around the world. After the party had gone about five months M. Janssen was compelled to return on account of ill health but the two brothers continued their journey to South America and in 1858 and 1859 explored the mining regions of Peru, Bolivia, and Chile and the passes between Santiago and Buenos Aires. An account of their collections was published in 1860 by Ernest Grandidier.

In 1863 Alfred embarked alone for India and visited Ceylon. He intended to explore the high plateau of Tibet but was prevented by a severe attack of fever and proceeded to the island of Zanzibar to recuperate. Here he remained some time, made important collections and published an account of his observations. He then visited the island of Réunion and in 1865 made his first visit to Madagascar which from that time became the chief subject of his investigations. A second voyage to Madagascar in 1866 was followed by a third in 1868, which lasted about two years and a half, when his work was interrupted by the Franco-Prussian war and he started home in 1870 never to return. During his explorations he crossed the island three times, traveled 3000 kilometers in the interior and 2500 along the coast and made about 1500 geodetic observations. These observations were utilized in the preparation of a map of the island which became the basis of all later explorations and earned for him in 1872 the gold medal of the Geographic Society.

After the war of 1870 he married Mlle. Vergé and began the preparation of his great work, 'L'Histoire politique, physique et naturelle de Madagascar.' This work undertaken in cooperation with A. Milne-Edwards, Vaillant and others, will include 39 volumes of which some 25 have been published and the others will probably be completed by his son Guillaume. The volumes treating of the birds (XII-XV), include one of text and three of plates, published under the joint authorship of Milne-Edwards and Grandidier from 1876 to 1885 and contain an exhaustive account of the avifauna of the island. His other contributions to ornithology include about half a dozen brief papers on the birds of Madagascar published between 1867 and 1872.¹—T. S. P.

FRANK ERNEST WOODWARD, an Associate of the Union since 1919 and a well known Boston business man, died at Brookline, Mass., Aug. 5,

¹For a more extended account of his life on which this notice is largely based, see *Comptes Rendus Acad. Sci., Paris*, Vol. 173, pp. 485-488. Sept. 19, 1921.

1921, from the effect of an accident in which he had been injured a few days before. He was the son of Samuel and Jerusha Baker (Erskine) Woodward and was born in Damariscotta, Maine, Jan. 2, 1853. He was a Mayflower descendant and also a descendant of Nathaniel Woodward who settled at Boston in 1633. His education was received at the Lincoln Academy at New Castle, Me., and at the Chelsea High School. At the age of 18 he entered the service of the Magee Furnace Company, became a member of the firm in 1887, and in 1905 organized the firm of Frank E. Woodward & Co., heating and ventilating engineers. Mr. Woodward took an active part in the work of patriotic and historic societies, serving as a trustee of the Malden Public Library 1903-1910, vice president and president of the Society of Mayflower Descendants, member of the Council of the New England Historic-Genealogical Society and president of the Massachusetts Society of the Sons of the Revolution. He wrote many magazine articles on genealogical and historical subjects besides publishing genealogies of the Woodward and Erskine families.—T. S. P.

COL. BASIL HICKS DUTCHER, U. S. A., an Associate of the Union from 1886 to 1910, died at Walter Reed Hospital, Washington, D. C., Jan. 16, 1922. He was the son of William and Catharine Price Dutcher and was born at Bergen Point, N. J., Dec. 3, 1871. He graduated from the Columbia School of Mines in 1892 and from the College of Physicians and Surgeons, New York, in 1895. At an early age he became interested in natural history and accompanied his father on many collecting trips to Long Island and other points in the vicinity of New York. At the age of 19 he was appointed a field assistant in the Division of Ornithology of the U. S. Dept. of Agriculture and took part in the biological reconnaissance of Idaho under the direction of Dr. C. Hart Merriam in 1890. In the following summer he became a member of the Death Valley Expedition and for three months was in charge of a meteorological Station in Big Cottonwood Meadows near Mt. Whitney, Calif., at an altitude of about 10,000 feet. Shortly after receiving his medical degree he secured an appointment in the army as an assistant surgeon with the rank of 1st Lieutenant and during his 25 years of service was stationed at several posts in the Southwest, in the Philippines, Porto Rico, and Panama, and during the World War he was in charge of a hospital at Brest, France. Upon his retirement from active service early in 1920 he took up his residence at Chevy Chase, Maryland, where he lived until his death. Among his natural history publications his paper on 'Bird Notes from Little Gulf Island, N. Y.,' in 'The Auk' for 1889, pp. 124-131, and his account of the 'Mammals of Mt. Katahdin, Maine,' in the Proceedings of the Biological Society of Washington for 1903, pp. 63-71, contain a number of notes of permanent value.—T. S. P.

FOLLOWING the appointment of Dr. Wilfred H. Osgood as Curator of the Department of Zoology in the Field Museum of Natural History, there has been a reorganization of the Department and a considerable increase in personnel. In the division of birds, the staff will be as follows: Dr. C. E. Hellmayr, Associate Curator; Mr. John T. Zimmer, Assistant Curator; Mr. Colin C. Sanborn, Assistant; and Mr. Ashley Hine, Taxidermist. Mr. Boardman Conover, whose private collection of game birds is deposited in the Museum, is a volunteer associate. Other additions to the Department include Mr. Edmund Heller as Assistant Curator of Mammals and Mr. Karl P. Schmidt as Assistant Curator of Reptiles and Batrachians.

Dr. Hellmayr, who is an Honorary Fellow of the A. O. U., and one of the most distinguished of European ornithologists, is now at the Museum of the University of Munich, Germany. He expects to arrive in America early in September and on reaching the Field Museum will devote himself largely to work connected with the completion of the series of volumes on the 'Birds of the Americas' begun by the late Charles B. Cory. His extensive knowledge of Neotropical birds especially qualifies him for this task and for other work relating to the exploration of South America which the Field Museum is now undertaking. Needless to say, all American ornithologists will welcome his accession to their ranks.

Mr. Zimmer, formerly of the University of Nebraska and more recently engaged in zoological work in the Philippines and New Guinea, joined the Museum's staff in January and left in March for extensive field work in Peru and Brazil accompanied by Mr. Heller who will collect mammals. Mr. Conover and Mr. Hine were engaged in field work during May in the vicinity of Edmonton, Alberta.

ON MARCH 14th a number of ornithologists of Washington met at the residence of Mr. B. H. Swales and organized the Baird Club. Dr. A. K. Fisher was elected president, Ned Hollister vice president, and B. H. Swales secretary. The club, named in honor of Spencer Fullerton Baird, nestor of Washington ornithologists, is an informal organization intended to promote social intercourse among its members and to discuss questions on local and general interest in ornithology.

THE 75th BIRTHDAY of Mr. John H. Sage, ex-president of the Union, on April 20, was celebrated by the Baird Club on an outing at the Washington Biologist's Field Club on Plummer Island on the Potomac at which the guests of honor were Mr. Sage, Mr. J. H. Fleming of Toronto and Dr. Casey A. Wood who had just returned from British Guiana. Two days later Dr. Wood gave an informal dinner at the Cosmos Club in honor of Mr. Sage which was attended by 15 local ornithologists and several guests.

AN UNUSUAL number of members of the Union are abroad this summer. Dr. Jonathan Dwight and Dr. Casey A. Wood are spending the summer in England, Mr. T. Gilbert Pearson sailed early in May for a brief trip to France, Holland and England, Mrs. V. M. Reichenberger is doing some special work in Munich, Dr. F. M. Chapman left for South America to June to resume field work in Ecuador, and Mr. Rollo H. Beck is still collecting in the South Pacific for the American Museum of Natural History, and Dr. Leonhard Stejneger expects to revisit the Commander Islands, Siberia, in connection with a trip to Alaska. Mr. Henry W. Fowler will leave shortly for a year's stay in Honolulu and vicinity and Dr. Wm. E. Hughes is on his way to the Feejee Islands.

THE annual meeting of the American Ornithologists' Union for 1922, being the fortieth stated meeting, will be held in Chicago, Illinois, the week beginning October 23. The public sessions will be held October 24, 25, and 26 in the magnificent new building of the Field Museum of Natural History situated in Grant Park on the shore of Lake Michigan within sight and walking distance of the business district and many of the best hotels.

Since this will be the first stated meeting of the Union to be held in the Mississippi Valley, it is hoped that it may be widely representative of the whole country with a good attendance from both east and west. The usual participants at eastern meetings, including the well known ornithologists of New York, Boston, Philadelphia and Washington, will be well represented and it will be a particularly happy occasion if a good delegation is present from the numerous active ornithologists of the Pacific Coast. From Chicago itself and from the states of the Middle West and South a large attendance is confidently expected.

Chicago is a favorite convention city and will provide ample entertainments and social features. Plans will include an excursion to the interesting sand dune region of Indiana some forty miles southeast of Chicago and shorter excursions will be optional. It is proposed also to hold an exhibition of bird painting following the example so successfully set at the Washington meeting in 1918. This feature will be especially developed and doubtless will be greatly appreciated by those who have not previously had opportunity to see a large and varied collection of original paintings of birds. Besides pictures to be exhibited by the artists themselves, it is hoped that pictures owned by various members of the Union will be loaned for the occasion under terms which will entail no expense or risk to the owners. Correspondence in regard to this is invited by the Chairman of the local committee.

The committee of arrangements consists of Wilfred H. Osgood (chairman), Percival B. Coffin, Ruthven Deane, O. N. Schantz, and R. M. Strong, together with the President and Secretary of the A. O. U., *ex-officio*.